

**Application for Pipeline  
Routing Permit and for  
Partial Exemption from  
Pipeline Route Selection  
Procedures (Pursuant to Minnesota  
Rules 4415)**

EQB Docket No. 04-77-PRP  
CALPINE

**Mankato Energy Center  
Mankato, Minnesota**

Submitted by:

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**Wenck File #1294-01**

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**April 2004**



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# Table of Contents

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<b>1.0</b>	<b>GENERAL INFORMATION (MINNESOTA RULE 4415.0115).....</b>	<b>1-1</b>
1.1	The Applicant's complete name, address and telephone number:.....	1-1
1.2	The complete name, title, address and telephone number of the official or agent to be contacted concerning the applicant's filing:.....	1-1
1.3	The Signature and title of the person authorized to sign the application is:.....	1-2
1.4	A brief description of the Proposed Project:.....	1-2
1.4.1	General Location.....	1-2
1.4.2	Planned Use and Purpose.....	1-3
1.4.3	Estimated Costs .....	1-3
1.4.4	Planned In-Service Date .....	1-3
1.4.5	General Design and Operations/Specifications of the Type of Pipeline for Which an Application is Submitted .....	1-3
<b>2.0</b>	<b>DESCRIPTION OF PROPOSED PIPELINE AND ASSOCIATED FACILITIES (MINNESOTA RULE 4415.0120).....</b>	<b>2-1</b>
2.1	Pipeline Design Specifications (Subpart 1) .....	2-1
2.1.1	Pipe Size (nominal outside diameter) .....	2-1
2.1.2	Pipe Type .....	2-1
2.1.3	Nominal Wall Thickness: .....	2-2
2.1.4	Pipe Design Factor:.....	2-2
2.1.5	Longitudinal or Seam Joint Factor:.....	2-2
2.1.6	Class Location and Requirements:.....	2-2
2.1.7	Specified Pipe Strength:.....	2-2
2.2	Operating Pressure (Subpart 2).....	2-3
2.2.1	Operating Pressure.....	2-3
2.2.2	Maximum Allowable Operating Pressure (psig).....	2-3
2.3	Description of Associated Facilities (Subpart 3) .....	2-3
2.4	Product Capacity Information (Subpart 4).....	2-3
2.5	Product Description (Subpart 5) .....	2-3
<b>3.0</b>	<b>LAND REQUIREMENTS (MINNESOTA RULE 4415.0125).....</b>	<b>3-1</b>
3.1	Permanent Right-of-Way Length, Average Width, and Estimated Acreage (Paragraph A).....	3-1
3.2	Temporary Right-of-Way (workspace) Length, Estimated Width, and Estimated Acreage (Paragraph B).....	3-1
3.3	Estimated Range of Minimum Trench or Ditch Dimensions including Bottom Width, Top Width, Depth, and Cubic Yards of Dirt Excavated (Paragraph C).....	3-1
3.4	Minimum Depth of Cover for State and Federal Requirements (Paragraph D).....	3-2

---

## Table of Contents (Cont.)

---

3.5	Rights-of-Way Sharing or Paralleling: Type of Facility in the Right-of-Way, and the Estimated Length, Width, and Acreage of the Right-of-Way (Paragraph E).....	3-2
<b>4.0</b>	<b>PROJECT EXPANSION (MINNESOTA RULE 4415.0130).....</b>	<b>4-1</b>
<b>5.0</b>	<b>RIGHT-OF-WAY PREPARATION PROCEDURES AND CONSTRUCTION ACTIVITY SEQUENCE (MINNESOTA RULE 4415.0135).....</b>	<b>5-1</b>
5.1	Right-of-Way .....	5-1
5.2	Clearing/Grading.....	5-2
5.3	Trenching .....	5-2
5.4	Stringing .....	5-3
5.5	Bending .....	5-3
5.6	Line-Up.....	5-3
5.7	Welding .....	5-4
5.8	Coating and Lowering-In.....	5-4
5.9	Backfill.....	5-4
5.10	Testing.....	5-5
5.11	Clean-up and Restoration.....	5-5
<b>6.0</b>	<b>LOCATION OF PREFERRED ROUTE AND DESCRIPTION OF ENVIRONMENT (MINNESOTA RULE 4415.0140).....</b>	<b>6-1</b>
6.1	Preferred Route Location (Subpart 1) .....	6-1
6.2	Other Route Locations (Subpart 2) .....	6-1
6.3	Description of Environment (Subpart 3) .....	6-2
6.3.1	Human Settlement and Population Density .....	6-2
6.3.2	Soils .....	6-2
6.3.3	Water .....	6-3
6.3.4	Vegetation and Wildlife.....	6-3
6.3.5	Cultural resources .....	6-4
6.3.6	Special Areas.....	6-4
6.3.7	United States Fish and Wildlife Service.....	6-4
<b>7.0</b>	<b>ENVIRONMENTAL IMPACT OF PREFERRED ROUTE (MINNESOTA RULE 4415.0145).....</b>	<b>7-1</b>
7.1	Human Settlement and Population Density .....	7-1
7.2	Land Use .....	7-2
7.3	Terrain and Geology.....	7-3

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## Table of Contents (Cont.)

---

7.4	Soils .....	7-4
7.4.1	Water .....	7-4
7.4.2	Vegetation and Wildlife.....	7-6
<b>8.0</b>	<b>RIGHT-OF-WAY PROTECTION AND RESTORATION MEASURES</b>	
	<b>(MINNESOTA RULE 4415.0150).....</b>	<b>8-1</b>
8.1	Protection (Subpart 1).....	8-1
8.2	Restoration (Subpart 2).....	8-2
<b>9.0</b>	<b>OPERATION AND MAINTENANCE (MINNESOTA RULE 4415.0160).....</b>	<b>9-1</b>
<b>10.0</b>	<b>LIST OF GOVERNMENT AGENCIES AND PERMITS (MINNESOTA RULE</b>	
	<b>4415.0165).....</b>	<b>10-1</b>

### **FIGURES**

1	Site Location Map - USGS Quadrangle
2	Aerial Photo Map
3	Land Use Map
4	Proposed Natural Gas Pipeline Route Features

### **APPENDICES**

A	Material Safety Data Sheet for Methane
B	Typical Trench Detail
C	SHPO Response Letter
D	Archaeological Survey Report
E	Minnesota Department of Natural Resources Response Letter

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## **1.0 General Information (Minnesota Rule 4415.0115)**

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### **1.1 THE APPLICANT'S COMPLETE NAME, ADDRESS AND TELEPHONE NUMBER:**

Mankato Energy Center, LLC  
4100 Underwood Road  
Pasadena, Texas 77507  
Attn: Mr. Jason M. Goodwin, P.E.  
Telephone: (832) 476-4463  
Fax: (281) 291-7089  
Email: jgoodwin@calpine.com

### **1.2 THE COMPLETE NAME, TITLE, ADDRESS AND TELEPHONE NUMBER OF THE OFFICIAL OR AGENT TO BE CONTACTED CONCERNING THE APPLICANT'S FILING:**

Mr. Jason M. Goodwin, P.E.  
Manager - Safety, Health, and Environmental  
Midwest Power Region  
Calpine Corporation  
4100 Underwood Road  
Pasadena, Texas 77507  
Telephone: (832) 476-4463  
Fax: (281) 291-7089  
Email: jgoodwin@calpine.com

**1.3 THE SIGNATURE AND TITLE OF THE PERSON AUTHORIZED TO SIGN  
THE APPLICATION IS:**

Mr. James J. Shield  
Vice President, Business Development  
250 Parkway Drive, Suite 380  
Lincolnshire, IL 60069

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James J. Shield, Vice President, Business Development

**1.4 A BRIEF DESCRIPTION OF THE PROPOSED PROJECT:**

**1.4.1 General Location**

Mankato Energy Center, LLC (“Mankato Energy”) proposes to construct a natural gas pipeline (the “Pipeline”) from an interconnection with an existing Northern Natural Gas Company (“NNG”) pipeline located in the south ¼ of Section 27 to the combined cycle natural gas power plant proposed by Mankato Energy in Lime Township (the “Facility”).<sup>1</sup> The Pipeline will be located entirely in Blue Earth County in south central Minnesota.

The Pipeline will traverse from the NNG interconnection point West along the Southern boundary of Sections 27 and 28. At a point in the SE ¼ of Section 28, the Pipeline will proceed south into the NE ¼ of Section 33. The Pipeline will continue west along the Northern boundary of Sections 33 and 32. At a point in the NW ¼ of Section 32 the Pipeline will proceed in a generally diagonal fashion Southwesterly into Section 31 terminating at the power plant, which is located in the SW ¼ of Section 31. The Pipeline will be approximately 4.0 miles long.

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<sup>1</sup> A detailed description of the Facility is provided in the Site Permit Application submitted by Mankato Energy to the EQB on March 3, 2004.

#### **1.4.2 Planned Use and Purpose**

The Pipeline will provide natural gas to the Facility. Natural gas will serve as the Facility's primary fuel supply.

#### **1.4.3 Estimated Costs**

The Pipeline is estimated to cost \$6,185,807.

#### **1.4.4 Planned In-Service Date**

The Facility is scheduled to be operational by June 2006. The Pipeline is scheduled to be operational in the first quarter of 2006.

#### **1.4.5 General Design and Operations/Specifications of the Type of Pipeline for Which an Application is Submitted**

The Pipeline will be welded steel, fusion bonded epoxy-coated pipe with a nominal outside diameter of 20 inches. The proposed Maximum Allowable Operating Pressure ("MAOP") for the Pipeline is 936 pounds per square inch gauge ("psig").

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## **2.0 Description of Proposed Pipeline and Associated Facilities (Minnesota Rule 4415.0120)**

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### **2.1 PIPELINE DESIGN SPECIFICATIONS (SUBPART 1)**

The specifications for pipeline design and construction are assumed to be in compliance with all applicable state and federal rules or regulations unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the anticipated pipeline design specifications must include, but are not limited to, the United States Department of Transportation Safety Regulations, Title 49 Code of Federal Regulations (“CFR”) Part 192, prescribing minimum federal safety standards for construction, operation, and maintenance of natural gas pipelines.

Mankato Energy will comply with safety standards for construction, operation, and maintenance of natural gas pipelines. Mankato Energy will comply with 49 CFR Parts 191, 192, and 199 in constructing, operating, and maintaining the Pipeline. Pipeline safety matters for this facility are under the jurisdiction of the Minnesota Office of Pipeline Safety (“OPS”).

#### **2.1.1 Pipe Size (nominal outside diameter)**

20 inches

#### **2.1.2 Pipe Type**

American Petroleum Institute (“API”) has a published specification for high-test line pipe. This specification covers various grades of seamless and welded steel line pipe and specifies manufacturing process, chemical and physical requirements, test methods, dimensions, and other parameters. Grade designates pipe manufactured according to API specification 5L with required minimum yield strength designated in pounds per square inch. Electric resistance weld



("ERW") pipe has one longitudinal seam, which is formed by electric resistance welding during the manufacturing process.

### **2.1.3 Nominal Wall Thickness:**

Nominal Outside Diameter (in.), Nominal Wall thickness (in.)

Mainline: 20 inches Outside Diameter, 0.312 inches Wall Thickness

Under Roads and Streams: 20 inches Outside Diameter, 0.500 inches Wall Thickness

### **2.1.4 Pipe Design Factor:**

The pipe design factor is 0.5.

### **2.1.5 Longitudinal or Seam Joint Factor:**

The longitudinal or seam joint factor is 1.0.

### **2.1.6 Class Location and Requirements:**

Class location determines which design factor of safety is used in the design formula. For this project, Class 3 requirements have been used. The design factor of safety used for natural gas steel pipelines is based on requirements of 49 CFR 192.111.

### **2.1.7 Specified Pipe Strength:**

The specified strength for pipe used in this project will have a minimum yield strength of 60,000 psig. In accordance with API 5L, pipe used on this project will have a minimum tensile strength of 75,000 psig.

## **2.2 OPERATING PRESSURE (SUBPART 2)**

### **2.2.1 Operating Pressure**

The normal operating pressure of the Pipeline will be between 525 psig and 550 psig.

### **2.2.2 Maximum Allowable Operating Pressure (psig)**

The maximum allowable operating pressure of the Pipeline will be 936 psig.

## **2.3 DESCRIPTION OF ASSOCIATED FACILITIES (SUBPART 3)**

The Pipeline will have aboveground valves at the beginning and end of its length along with associated launching and receiving scraper traps. At the NNG tap, there will be regulation and measurement facilities above ground. Mankato Energy will install marker posts along the route to identify the location of the buried facilities. The line will terminate at the Facility

## **2.4 PRODUCT CAPACITY INFORMATION (SUBPART 4)**

The Pipeline and associated facilities are designed to have a maximum throughput capacity of 126 million cubic feet per day. The minimum throughput design is one million cubic feet per day.

## **2.5 PRODUCT DESCRIPTION (SUBPART 5)**

The Pipeline will carry natural gas (primarily methane), a non-hazardous, but highly flammable gas, to be used by Mankato Energy as the primary fuel for the generation of electricity. A Material Safety data Sheet (“MSDS”) for natural gas is contained in Appendix A.

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## **3.0 Land Requirements (Minnesota Rule 4415.0125)**

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### **3.1 PERMANENT RIGHT-OF-WAY LENGTH, AVERAGE WIDTH, AND ESTIMATED ACREAGE (PARAGRAPH A)**

The proposed right-of-way (“ROW”) for the Pipeline is approximately four miles in length. The Pipeline will be placed on a permanent right-of-way 50 feet in width. Approximately 24.3 acres of new ROW will be acquired.

### **3.2 TEMPORARY RIGHT-OF-WAY (WORKSPACE) LENGTH, ESTIMATED WIDTH, AND ESTIMATED ACREAGE (PARAGRAPH B)**

Along most of the route, an additional 25 feet of temporary workspace will be acquired. It is anticipated that this space will be fully utilized, and will give the construction crews approximately 75 feet of total area for workspace. Localized conditions such as roads, railroads, and water body crossings may require additional temporary workspace to complete the installation. Permission to use temporary workspace will be obtained from landowners adjacent to the permanent ROW. Approximately 14 acres of temporary workspace will be acquired.

### **3.3 ESTIMATED RANGE OF MINIMUM TRENCH OR DITCH DIMENSIONS INCLUDING BOTTOM WIDTH, TOP WIDTH, DEPTH, AND CUBIC YARDS OF DIRT EXCAVATED (PARAGRAPH C)**

Trenching is typically accomplished using a crawler-mounted, wheeled-type ditch digging machine or backhoe. Typically, the ditch will be 80 inches deep to allow sufficient cover as specified by statute. Trench width will be a minimum of 33 inches for the 20-inch outside diameter pipe. Assuming the maximum possible depth, this project will result in approximately 13,900 cubic yards of soil excavation. Appendix B contains a typical trench detail.

### **3.4 MINIMUM DEPTH OF COVER FOR STATE AND FEDERAL REQUIREMENTS (PARAGRAPH D)**

The State of Minnesota requires a minimum depth of cover to be 54 inches in certain areas as detailed in Minnesota Statutes 116I.06, Subdivisions 1, 2, and 3. Mankato Energy will require a minimum of 54 inches of ground cover for this proposed pipeline. Federal minimum cover requirements range from 18 inches to 48 inches depending on the circumstances encountered. In complying with the state requirements, the federal requirements will also be met.

### **3.5 RIGHTS-OF-WAY SHARING OR PARALLELING: TYPE OF FACILITY IN THE RIGHT-OF-WAY, AND THE ESTIMATED LENGTH, WIDTH, AND ACREAGE OF THE RIGHT-OF-WAY (PARAGRAPH E)**

The majority of the proposed route follows an existing 115 kV transmission line right-of-way controlled by Xcel Energy. This will minimize potential impacts to the environment and to landowners located along the proposed route. The remaining portion of the Pipeline will follow existing road and railroad ROWs.

Existing ROWs were utilized in order to greatly minimize potential impacts to the environment and to landowners located along the proposed route. The ROWs continue to be inspected and cleared for use. Utilizing existing ROWs will insure that little environmental impact will be realized for the Pipeline.

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## **4.0 Project Expansion (Minnesota Rule 4415.0130)**

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The Pipeline will be designed to meet the current and future natural gas supply needs of the Facility. No plans for expansion have been incorporated into the design.

If the Pipeline and associated facilities are expanded in the future, the applicant will provide a description of how the facilities will be expanded. Such expansion may be accomplished by looping, by additional compressor and pump stations, or by other available methods.

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## **5.0 Right-of-Way Preparation Procedures and Construction Activity Sequence (Minnesota Rule 4415.0135)**

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Each applicant shall provide a description of the general right-of-way preparation procedures and construction activity sequence anticipated for the proposed pipeline and associated facilities.

### **5.1 RIGHT-OF-WAY**

The first step in construction of a pipeline is to prepare the ROW. The centerline of the pipeline and points of intersection tangents will be established by a survey. Staking will be at a maximum of 400-foot intervals. A construction ROW 75 feet wide would be cleared. Aboveground vegetation and obstacles will be cleared as necessary to allow safe and efficient use of construction equipment.

Storage areas required for equipment, pipe, and other materials will be acquired through private permission. These storage areas are expected to consist of vacant or commercially available facilities such as lumberyards, warehouses or similar type areas located strategically along the route. The storage areas will encompass approximately five acres.

When encountered along a ROW, fences will be adequately braced before any opening to the fence is made. Locking gates or appropriate fencing will be installed when construction in the area has been completed. Any damage to fences, gates, and cattle guards will be restored to the original condition or better. Access and livestock control will be employed during construction to limit impact to the use of the land.

## **5.2 CLEARING/GRADING**

Clearing of the ROW will follow accepted industry practices and sound construction guidelines. In areas where timbering is required, the trees will be cut in uniform lengths and stacked along the ROW based on the landowner's preferences. The profile of stumps left from timbering will be as low as possible. The removal of stumps will be limited to only that necessitated by pipeline installation unless otherwise negotiated with the landowner. Debris created from ROW preparation will be disposed of using approved methods during restoration.

After the construction area has been cleared of obstacles and prior trenching, the area will be graded as necessary to create a relatively flat work surface for the passage of heavy equipment and vehicles for subsequent construction activities. Minimal grading will be required on most of the ROW where the terrain is flat to gently sloping. In particularly difficult terrain, a nominal 75-foot wide construction ROW may not be sufficient. Grading and cut-and-fill excavation will be performed to minimize effects on natural drainage and slope stability. On steep terrain or in wet areas, where the ROW must be graded at two elevations (i.e., two-toning) or where diversion dams must be built to facilitate construction, the areas will be restored upon completion of construction to resemble original conditions. Excavation and grading will only be undertaken where necessary to increase stability and decrease the gradient of unstable slopes.

## **5.3 TRENCHING**

Most trenching will be performed using a bucket-wheel ditching machine. Conventional tracked backhoes will be used where ground conditions are unsuitable for a ditching machine and if a deeper or wider trench is required. Trench dimensions will comply with applicable normal land use and regulatory requirements. In wet marshy areas, draglines and clamshells will be used to do the ditching. To ensure the pipe is buried at the proper depth, the trench will be drained or pumped dry where practicable or concrete coated pipe or concrete weights will be used to overcome any buoyant force. Where the pipe crosses highway or road ditches, the trench or boring will be excavated deep enough to provide a minimum of 54 inches of cover over the pipe to comply with Minnesota Department of transportation ("MNDOT") requirements. All surfaced

road crossings will be bored so that traffic flow will not be interrupted. If required by MNDOT or another entity having appropriate jurisdiction, the crossings will also be cased.

In areas where there is a need to separate top and subsoil, a two-pass trenching process will be used. The first pass will remove topsoil and the second pass will remove subsoil. Spoils from each of the excavations will be placed in separate spoil banks. This will allow for proper restoration of the soil during the backfilling process. Spoil banks will contain gaps to prevent storm runoff water from backing up or flooding.

#### **5.4 STRINGING**

The operation of stringing involves the placement of pipe, from a pipe storage facility or from the pipe mill, along the ROW.

Pipe will be loaded onto trucks, transported to the ROW, and unloaded by sidebooms rigged to handle pipe. The pipe will be strung either prior to or after ditching.

#### **5.5 BENDING**

After the joints of pipe are strung along the trench and before the joints of pipe are joined together, individual joints of the pipe will be bent to allow for uniform fit of the pipeline with the varying contours of the bottom of the trench and to accommodate changes in the route direction. A track-mounted, hydraulic pipe-bending machine is normally used for this purpose when using the size of pipe proposed for this project. The number of degrees of deflection that is allowed in a field bend is limited to 1 1/2 degrees per length of pipe equal to the diameter of the pipe. Bends required that are greater than that allowed in the field will be factory fabricated.

#### **5.6 LINE-UP**

Installation of the pipe, following the bending will commence with internally swabbing the pipe, and aligning the bevels for welding. The weld material will be deposited after the proper spacing



and alignment of the bevels is accomplished. The line-up clamps will be held until enough of the weld is completed to assure weld integrity.

## **5.7 WELDING**

A very important phase of pipeline construction is the welding process. Welding is the joining of the individual joints of pipe to form the pipeline. Welding must be performed by a qualified welder in accordance with welding procedures qualified to meet the code requirements. All welders will be qualified in accordance with API 1104.

Every weld will be inspected by radiographic examination to determine the quality of the weld. Radiographic examination is a nondestructive method of inspecting the inner structure of welds to determine if any defects are present. Defects will be repaired or removed as outlined in API 1104, the code for "Welding of Pipelines and Related Facilities," which is incorporated by reference by 49 CFR 192.

## **5.8 COATING AND LOWERING-IN**

After welding, the girth weld and the pipe adjacent to the weld must be protected from corrosion. When the field coating or wrapping of the weld is completed, the pipeline is ready to be lowered into the trench. Special side boom tractors spread out along the Pipeline will simultaneously lift the line and move it over the open trench. The welded string of pipe will then be lowered into the trench. An electronic detector will be used to monitor the coating during this operation to assure the coating is not damaged. The detector has a device that is pulled along the circumference of the pipe and uses electrical voltage to find any voids in the coating.

## **5.9 BACKFILL**

After the pipe has been lowered into the ditch, the trench will be backfilled. The operation will be performed in a manner that will prevent damage to the pipe and pipe coating from equipment or from backfill material. Excess backfill material will be bermed over the ditch centerline to permit natural settling. Where the ditching process was used to separate top and subsoil, backfill

will be installed by placing the subsoil into the trench prior to placement of the topsoil to maintain the soil segregation.

## **5.10 TESTING**

After backfilling, the pipeline will be tested to ensure that the system is capable of withstanding the operating pressure for which it was designed. The Pipeline will be filled with water and a pressure equal to 1.5 times the design pressure is maintained for a minimum of eight hours. Terrain elevations will determine length of test sections. Test water will be disposed of in accordance with permit requirements or other applicable regulations.

## **5.11 CLEAN-UP AND RESTORATION**

The final phase of Pipeline construction will involve clean up and restoration of the ROW. Removal and disposal of construction debris and any surplus materials would be a part of the clean up. Restoration of the ROW surface will involve smoothing by chisel plow or disc harrows or other equipment, and stabilizing when necessary. In non-cropland areas, the ROW will be re-vegetated according to agreement with the landowner or appropriate government agency.

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## **6.0 Location of Preferred Route and Description of Environment (Minnesota Rule 4415.0140)**

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### **6.1 PREFERRED ROUTE LOCATION (SUBPART 1)**

The application must identify the preferred route for the proposed pipeline and associated facilities on any of the following documents, which must be submitted with the application:

- A. United States Geological Survey topographical maps to the scale of 1:24,000, if available.
- B. Minnesota Department of Transportation County Maps.
- C. Aerial photos or other appropriate maps of equal or greater detail in items A and B. The maps; or photos may be reduced for inclusion in the application. One full sized set shall be provided to the Board.

Figure 1 consists of a United States Geological Survey topographic map that identifies the proposed route. Figure 2 consists of an aerial photo showing the proposed route.

### **6.2 OTHER ROUTE LOCATIONS (SUBPART 2)**

The proposed route for the Pipeline was selected because it utilizes existing ROWs (transmission line, roadways, railroads) and because of the location of the connection point. Utilizing the existing ROWs greatly minimizes potential impacts to the environment. Alternative routes were considered, but not evaluated further. Alternative routes would cause a greater impact to the environment and surrounding areas.

## **6.3 DESCRIPTION OF ENVIRONMENT (SUBPART 3)**

### **6.3.1 Human Settlement and Population Density**

The Pipeline will be installed in rural and urban areas of Blue Earth County in south central Minnesota. The land use is predominately farming with a few farmsteads along the route. There are approximately 20 parcels of property crossed by the route. Except for public roads, the proposed pipeline passes through private land for the entire length of the route. Figure 3 shows existing land use.

### **6.3.2 Soils**

The proposed Pipeline is in an area with depth of unconsolidated materials between 90 feet in the eastern area below the bluffs and 40 feet in the western area. Geologic formations consist of glacial deposits of mostly till, with some sand and gravel outwash, and lake clay (including some recent Holocene deposits near the river). The specific conditions of the soils along the proposed Pipeline are typical of this area, made up of relatively poorly drained silty or clayey loam.

According to the Blue Earth County Soil Survey, 23 different soils are found within the project area:

- Lester Loam, 2-6% slopes
- Lester Loam, 6-12% slopes
- Lester Loam, 12-18% slopes
- Cordova Clay Loam
- Webster Silty Clay Loam
- Glencoe Silty Clay Loam
- Comfrey Clay Loam
- Litchfield Loamy Fine Sand, 1-3% slopes
- Lasa Fine Sand, 2-8% slopes
- LeSueur Clay Loam, 1-3% slopes
- Oshawa Silt Loam

- Tilfer Silty Clay Loam
- Lasa Loamy Fine Sand, Rock Substratum, 1-12% slopes
- Hamel Clay Loam, 1-4% slopes
- Muskego Muck
- Palms Muck
- Calco Silty Clay Loam
- Copaston-Rock Outcrop Complex, 1-4% slopes
- Terril Loam, 2-6% slopes
- Terril Loam, 6-15% slopes
- Storden Complex, very steep
- Storden Complex, 24-45% slopes
- Rock Outcrop - Copaston Complex, very steep

### **6.3.3 Water**

One large creek, a drainage ditch, and several wetlands have been identified along the proposed Pipeline. The pipeline will also cross an intermittent stream. Figure 4 shows the locations of these features. The proposed method of stream crossing will be conventional open cut or an alternative construction technique in compliance with applicable regulatory requirements. With the wetlands, sufficient care will be taken during installation of the pipeline to avoid, mitigate, or restore them in accordance with existing regulatory requirements.

Minnesota Department of Natural Resources (“MDNR”) stream crossing permit applications will be submitted to the regional MDNR as required. Mankato Energy will comply with permit requirements.

### **6.3.4 Vegetation and Wildlife**

Because the proposed Pipeline will be installed along existing ROWs (transmission, roads, railroads) impacts to vegetation and wildlife are expected to be minimal. Vegetation along the Pipeline route predominantly consists of cultivated land with some secondary grassland

surrounding streams and farmsteads. The Pipeline also crosses small wooded sections. Wildlife species found along the pipeline route are typical to species found in an agricultural setting.

### **6.3.5 Cultural resources**

The Minnesota Historical Society State Historical Preservation Office (“SHPO”) was contacted to review the route pursuant to the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act. In a response letter dated January 20, 2004, SHPO recommended a Phase I Archaeological survey. A copy of the response letter is included in Appendix C. The survey was completed on April 14, 2004, and no historically significant areas or features were noted along the proposed route. A report of the survey findings is included in Appendix D.

### **6.3.6 Special Areas**

A review of the Minnesota Natural Heritage Information System database was requested from the Minnesota Department of Natural Resources (“DNR”) to determine if any rare plant communities or animal species, unique resources, or other significant natural features are known to occur on or near the proposed project site. As stated in a letter from the DNR dated January 12, 2004, results of the database search indicated that 14 rare features consisting of animals (snakes, fish, and birds) and natural plant communities (mesic prairie and floodplain forest) were known to occur within the vicinity of the project area. These rare features are beyond the site boundaries and, therefore, will not be directly affected by the project. This finding is confirmed in the DNR letter, which concludes that based on the nature and location of the proposed project, the known occurrences of rare features identified by the search would not be affected. A copy of the DNR letter is provided in Appendix E.

### **6.3.7 United States Fish and Wildlife Service**

There are no indications that the Pipeline will impact any federally listed threatened and endangered species. Information was requested from the U.S. Fish and Wildlife Service (“USFWS”) in a letter dated December 19, 2003 about possible federally threatened and endangered species that may exist at or near the Pipeline. Representatives of Mankato Energy

were verbally informed in a follow-up telephone conversation on February 26, 2004 with Lori Fairchild, USFWS Wildlife Biologist covering Blue Earth County, that a review of their records indicates that no federally listed species have been documented near the proposed Pipeline. Based on this finding, it may be concluded that the project will not adversely affect any threatened and endangered species or their critical habitat. Due to budget constraints, the USFWS only responds in writing if any issues or effects have been identified.

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## **7.0 Environmental Impact of Preferred Route (Minnesota Rule 4415.0145)**

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The applicant must also submit to the Board along with the application an analysis of the potential human and environmental impacts that may be expected from pipeline right-of-way preparation and construction practices and operation and maintenance procedures. These impacts include, but are not limited to, the impacts for which criteria are specified in Part 4415.0040 or 4415.0100.

An analysis of the impacts from construction of the Pipeline indicates they would be temporary. No long-term impacts are anticipated. The majority of the Pipeline will be installed in cultivated cropland that will continue to be used for the same purpose after the project is completed. Specific analyses of the impacts are listed below.

### **7.1 HUMAN SETTLEMENT AND POPULATION DENSITY**

Some short-term socioeconomic effects may occur to the population centers along the route. Approximately half of the anticipated work force will be from outside the local area. Their economic activities (e.g., housing rental, hotels, fuel sales, restaurants, and grocery stores) will likely add to the economies of Blue Earth County and the City of Mankato. Approximately the same number of local workers will be employed, which will increase the amount of local payrolls during the construction period. No significant or long-term demands for local government facilities or services are expected to occur due to the relatively short construction period.

Impacts to existing roads within the project area will be short-term and minimal. Paved road crossings would be bored, as would any important or heavily traveled gravel roads. This will eliminate most impact to traffic. No new roads will be constructed. Necessary road crossing permits will be obtained from state or local authorities. Impacts to existing railroads will be very



minimal as it is anticipated that the crossings will be accomplished by boring under the railroad. Right-of-way crossing permits will be obtained from the individual railroads.

No compression facilities will be installed on the Pipeline so there will not be any exhaust or other noise from these facilities. The Pipeline will not generate any noise under normal operations. During construction the machinery generates noise between 75 to 90 decibels measured at 50 feet of the equipment. The noise is typical for the machinery that is used in tilling, harvesting, and other agriculture operations. Equipment noise impact will be short-term as the construction process moves continuously along the ROW. Construction activities will take place during normal working hours.

## **7.2 LAND USE**

Land within the permanent ROW and any temporary workspace will be impacted during the construction period. The impact will be short-term, as the construction period normally will last about thirty days at any one location. All land will be restored as nearly as practicable to pre-construction conditions. No land will be removed from agricultural use because the Pipeline will be buried well below plow depth and drain tile. The cropland could return to production as soon as construction is completed. Pastureland will be re-seeded and quickly re-vegetated to pre-construction conditions following construction. During construction the agricultural land productivity will be reduced for a short time until the process moved past a particular area. Landowners will be compensated by Mankato Energy for any crop damages incurred due to that construction activity. All agriculture uses would be allowed to continue within the new permanent ROW. Figure 3 identifies existing land use in the area of the proposed pipeline.

Construction may impact appurtenant agricultural items such as drainage systems, fences, and livestock. When active tile drainage systems are encountered temporary repairs will be made immediately to allow continuation of flow. Permanent repair will be made prior to the start of restoration activities. Where fences or gates are encountered, temporary gaps will be installed. All fences and gates will be rebuilt to their approximate original or better condition. If it is necessary for livestock or farm machinery to cross the open trench, equipment bridges or trench

plugs will be strategically located to allow access. Appropriate fencing or other means will be employed to prevent any livestock from falling into areas where there are open trenches.

### **7.3 TERRAIN AND GEOLOGY**

Little or no impact to the terrain and geology should result from construction, operation, or maintenance of the Pipeline and associated facilities. No special construction techniques are expected to be necessary because of the terrain or geology. Impacts will be limited to the construction phase. Little or no grading is anticipated in order to prepare the surface for the construction equipment over most of the route.

At some steeper areas (i.e. bluff side slopes) more extensive grading may be required. Temporary erosion control measures such as jute matting and silt fencing will be utilized to prevent erosion until permanent measures are put in place. Any changes to the natural terrain will be re-graded to establish the natural contours that existed prior to construction. Permanent slope breakers will be installed to divert water off the ROW where necessary to prevent damage to the graded areas.

Sand and gravel are likely the primary mineral resource occurring along the proposed pipeline route. No active mining operation will be directly affected by the construction of the Pipeline. However, reserves within the permanent ROW could not be utilized for the life of the project.

Faults, earthquakes, landslide susceptibility, and ground subsidence in karst terrain are geologic hazards that may pose a risk to the integrity of a pipeline. There are no active faults located across or along the route of the Pipeline. Seismic activity in the area has been very limited. Because pipeline damage is usually associated with a large-scale catastrophic seismic event and no such earthquake has been recorded in the project area, the probability of damage to the Pipeline due to earthquake is unlikely. Because the Pipeline will be mainly in material not laid down by deposition over karst or rocks prone to dissolution, ground subsidence damage is highly unlikely.

## **7.4 SOILS**

The primary effect of pipeline construction on soils is erosion associated with disturbing the vegetative cover and loss of soil productivity due to soil mixing and/or compaction. Mixing of topsoil with sub-soil could impact productivity of cropland. Soil segregation practices eliminate virtually all mixing of topsoil and subsoil. Topsoil segregation methods in annually cultivated or rotated agricultural lands will be employed by Mankato Energy. Chisel or other type plowing, and/or other measures, during restoration of the affected area will mitigate soil compaction.

Temporary and permanent erosion control measures will be employed during construction to minimize erosion caused by water and wind. Slope breakers, sediment barriers, and mulch will be used to prevent erosion by water. Soil loss by wind could likely occur when the ROW area is very dry after the vegetative cover has been removed. During construction, activity will be limited when there is enough wind to cause erosion. It is typical to control dust during the construction phase with water applied by spray bars mounted on trucks equipped with water tanks. Excessive dust is detrimental to construction activities and is controlled diligently to avoid loss of production and to promote safety. After construction, restoration of the ROW in non-cropland areas includes seeding and mulching that help prevent further dust emissions. Impact to soils will be short term.

### **7.4.1 Water**

#### **Groundwater**

Construction of the Pipeline may cause minor impact on groundwater flow in localized areas, but will not affect overall groundwater recharge in the project area. Shallow aquifers could experience minor impact from changes in overland water flow and recharge caused by clearing and grading of the ROW. Construction equipment could also cause compaction of soils crossed by the construction ROW, resulting in locally reduced soil infiltration rates. The Pipeline trench will generally be about seven feet deep and would only intersect shallow aquifers. In low-lying areas, de-watering of the trench may be required and could temporarily affect groundwater levels in the immediate vicinity of the trench.

Any impacts to groundwater will be short term. Construction of the Pipeline will not require the installation or abandonment of any water wells or connection to or changes in any public water supply.

Refueling of vehicles, or the transportation and storage of fuel, oil, and other hazardous liquids could create a contamination hazard to aquifers. Accidental spills or leaks of hazardous liquids could contaminate soil and groundwater and affect aquifer users. Contaminated soils could continue to leach pollutants to the groundwater for an extended period of time after the spill or leak. Mankato Energy will prohibit refueling activities and storage of hazardous liquids within at least a 200-foot radius of all private wells and at least a 400-foot radius of all municipal or community water supply wells.

## **Surface Water**

The pipeline would cross the 100-year floodplain of the Minnesota River and three other streams and/or ditches. Flooding of major streams and rivers is confined to topographically distinct floodplains and occurs during heavy or extended rainfall events. However, because the Pipeline will be underground, there would be no effect on flood storage. No above ground facilities would be sited in a floodplain. If necessary, permits to cross these waterbodies will be obtained and the crossing methods will be dictated by the permit conditions.

In general, impact on surface waters could occur during pipeline construction activities, such as clearing and grading in areas adjacent to streams, trenching, trench de-watering, backfilling, and during withdrawal and discharge of hydrostatic test water. The magnitude of potential impact depends on several factors, including each stream's physical dimensions, stream bottom composition, rate of stream flow, water quality at and downstream of the crossing location, and erosion potential of soil in cleared areas adjacent to the stream.

All streams that are not directionally drilled will be crossed using the conventional open-cut method. The primary impact resulting from open-cut construction will occur during instream activities, and would include increased turbidity and sedimentation, and disruption of stream

bottom communities in the vicinity of the trenching location. These impacts will be temporary and short term because in-stream construction will be completed within 24 hours at minor waterbodies (less than 10 feet wide) and within 48 hours at intermediate waterbodies (between 10 and 100 feet wide).

A hydrostatic test of the Pipeline is required prior to it being placed in service. Mankato Energy proposes to withdraw approximately 330 thousand gallons from the City of Mankato's potable water supply system for this purpose. No chemicals will be added to the hydrostatic test water. The water will be tested for suspended solids, salinity and PH and other contaminants as required by specific permit prior to filling and during discharge. Once the test is completed, the water used in the test will be discharged in accordance with permit requirements or applicable regulations. The hydrostatic test water will be discharged into a holding tank with a progressive weir arrangement to trap rust, mill scale, or other undesirable items. The discharge rate will be regulated and splash plates or other similar devices installed to disperse the discharge in order to prevent erosion, streambed scour, suspension of sediments, or excessive stream flow. A hydrostatic test water appropriation permit will be obtained from the DNR, and a discharge permit will be obtained from the Minnesota Pollution Control Agency ("PCA") as required. Impacts will be minimal and short term.

#### **7.4.2 Vegetation and Wildlife**

##### **Vegetation**

Agricultural fields planted predominantly in corn and soybeans are the dominant vegetation types that would be crossed by the Pipeline. Grasslands will be re-vegetated quickly to pre-construction conditions following construction. After construction, Mankato Energy will only maintain a minimum amount of cleared ROW for operations and maintenance purposes. Construction of the Pipeline will result in short term impact to vegetation, but will not cause any appreciable change in the type of vegetation cover.

## **Wildlife**

Construction of the Pipeline will likely result in temporary and permanent impact on wildlife habitat, as well as minor, temporary impact on wildlife in the immediate vicinity of the construction areas. Clearing of vegetation will result in reduced cover, nesting, and foraging habitat for some wildlife. More mobile species will be temporarily displaced from the construction areas to similar habitats nearby. The long-term conversion of a small amount of forested land to a scrub/grassy condition will not significantly change the existing habitat composition or wildlife populations of the area.

In general, construction of the Pipeline at stream crossings could cause short-term increases in turbidity and siltation downstream and alteration or temporary loss of shoreline cover. This could result in temporary relocation of fish and other aquatic species that may occur near and downstream of the construction area.

## **Special Areas**

The DNR reviewed the Natural Heritage database to determine if any rare plant or animal species or other significant natural feature might be impacted by the proposed project. No such areas of historical significance were identified along the Pipeline route.

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## **8.0 Right-of-Way Protection and Restoration Measures (Minnesota Rule 4415.0150)**

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### **8.1 PROTECTION (SUBPART 1)**

**The applicant must describe what measures will be taken to protect the right-of-way or mitigate the adverse impacts of right-of-way preparation, pipeline construction, and operation and maintenance on the human and natural environment.**

Mankato Energy will develop a comprehensive Spill Prevention, Control and Countermeasure ("SPCC") procedure that deals with the protection, mitigation and restoration measures employed for a pipeline project. All of the Federal Energy Regulatory Commission measures for "Upland Erosion Control, Re-vegetation, and Maintenance Plan" and "Wetland and Waterbody Construction and Mitigation Procedures" relative to pipeline projects will be incorporated into the SPCC document. This document is available from Mankato Energy upon request. The SPCC document is included in the construction specifications attached to the prime contractor's agreement. It is an integral part of the construction inspection process and the relevant portions, or the documents in their entirety will be issued to construction personnel and all contractors associated with the work.

Mankato Energy will comply with the requirements of regulatory and permitting agencies such as the U.S. Army Corps of Engineers, DNR, and other agencies that may include conditions with permits. Where applicable, landowners will participate in developing the measures taken to mitigate any impacts to the land during construction or operation of the Pipeline.

## 8.2 RESTORATION (SUBPART 2)

**The applicant must describe what measures will be taken to restore the right-of-way and other areas adversely affected by construction of the pipeline.**

Minnesota Rules Section 4415.0195 allows certain construction related activities such as tile repair, soil segregation, livestock and crop protection, repair to private roads and fence, and gate repair or replacement to be negotiated with the landowner. Mankato Energy anticipates that contractor personnel will be responsible for these matters. One restoration item that is traditionally negotiated with landowners is reseeding of non-cropland areas such as pastureland. The Minnesota Environmental Quality Board will attach the following conditions to the routing permit as per the above-mentioned MN 4415.0195 relative to ROW preparation, construction, cleanup, and restoration:

- Mankato Energy shall comply with all applicable state rules and regulations.
- Mankato Energy shall limit clearing of the right-of-way to the combined width of the permanent and temporary ROW.
- Stream banks disturbed by pipeline construction must be stabilized using native plant species indigenous to the project area, or by other methods as required by applicable state and/or federal permits.
- Precautions shall be taken to protect and segregate topsoil in cultivated lands unless otherwise negotiated with the affected landowner.
- Compaction of cultivated lands by Mankato Energy must be kept to a minimum and confined to as small an area as practicable.
- Precautions to protect livestock and crops must be taken by Mankato Energy unless otherwise negotiated with the affected Landowner.
- All appropriate precautions to protect against pollution of the environment must be taken by Mankato Energy.
- All waste and scrap that is the product of the Pipeline construction process must be removed or properly disposed of before construction ends.



- Clean up of personal litter, bottles, and paper deposited by right-of-way preparation and construction crews must be done on a daily basis.
- Mankato Energy shall repair or replace all drainage tiles broken or damaged during right-of-way preparation, construction and maintenance activities, unless otherwise negotiated with the affected Landowner.
- Mankato Energy shall repair all private roads and lands damaged when moving equipment or when obtaining access to the right-of-way, unless otherwise negotiated with the affected landowner.
- Mankato Energy shall repair and replace all fences and gates removed or damaged as a result of right-of-way preparation, construction, and maintenance activities, unless otherwise negotiated with the affected landowner.
- Mankato Energy shall, to the extent possible, restore the area affected by the pipeline to the natural conditions that existed immediately before construction of the pipeline. Restoration must be compatible with the safe operation, maintenance, and inspection of the Pipeline.

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## **9.0 Operation and Maintenance (Minnesota Rule 4415.0160)**

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Pipeline operations and maintenance are assumed to be in compliance with all applicable state and federal rules or regulations, unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the applicant must provide a general description of the anticipated operation and maintenance practices planned for the proposed pipeline.

The Pipeline is jurisdictional to the Minnesota Office of Pipeline Safety (“MNOPS”). All facilities proposed for the Pipeline will be designed, operated, and maintained in accordance with U.S. Department of Transportation (“USDOT”) Minimum Federal Safety Standards in Title 49 of the CFR, Part 192 (49 CFR 192). These regulations are meant to ensure adequate protection for the public from failures of natural gas pipelines and related facilities. Part 192 defines and specifies the minimum standards for operating and maintaining pipeline facilities including the establishment of an Emergency Plan, which provides written procedures to minimize hazards from a gas pipeline emergency. Key elements of the plan include procedures for:

- Receiving, identifying, and classifying emergency events - gas leakage, fires, explosions and natural disasters.
- Establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency responses.
- Making personnel, equipment, tools, and materials available at the scene of an emergency.
- Protecting people first and then property, and making them safe from actual or potential hazards.
- Emergency shutdown of the system and safely restoring service.

The safety standards specified in Part 192 require each pipeline operator to:

- Develop an emergency plan, working with local fire departments and other agencies to identify personnel to be contacted, equipment to be mobilized, and procedures to be followed to respond to a hazardous condition caused by the Pipeline or associated facilities.
- Establish and maintain a liaison with the appropriate fire, police, and public officials in order to coordinate mutual assistance when responding to emergencies.
- Establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a natural gas pipeline emergency and report it to appropriate public officials.
- Use only qualified personnel to operate and maintain the pipeline in accordance with an Operator Qualification Plan.
- Have, maintain, and implement a Pipeline Integrity Management Plan for transmission lines in High Consequence areas.
- Ensure that personnel working on these facilities are part of a random drug testing program.

Before placing the Pipeline in service, Mankato Energy will prepare an Operating and Maintenance Procedures manual as well as an Emergency Response Plan for the proposed new pipeline and facilities. A Pipeline Integrity Management Plan will also be developed for any pipeline segment located within a High Consequence Area. Mankato Energy will inspect, operate, and maintain its pipeline facilities in compliance with all applicable pipeline safety regulations. Mankato Energy will establish comprehensive Damage and Public Education programs that will include:

- Membership in the Gopher State Excavators One-Call system.
- Establish and maintain personal contact with local fire, police and other public offices with emergency response responsibilities
- Establish a continuing education program for the public, government officials and excavation contractors.

- Install pipeline markers and signs identifying the pipeline location and provide emergency contact information
- Establish an emergency notification telephone number that will be attended 24 hours/day.

All personnel with operating and maintenance responsibilities for the proposed pipeline facilities will be certified under an Operator Qualification Plan and will participate in a USDOT compliant Drug and Alcohol program. Routine inspections of the pipeline ROW as well as cathodic protection surveys will be conducted to insure the integrity of the pipeline is maintained. All required reporting and documentation related to pipeline activities will be maintained and kept current and complete.

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## 10.0 List of Government Agencies and Permits (Minnesota Rule 4415.0165)

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Each application must contain a list of all the known federal, state, and local agencies or authorities and titles of the permits they issue that are required for the proposed pipeline and associated facilities.

The proposed project will require several federal, state, and local permits and approvals for construction of the pipeline route. Anticipated permits and approvals are listed below in Table 10-1.

**TABLE 10-1  
REQUIRED PERMITS AND APPROVALS**

Unit of Govern-ment*	Type of Approval	Regulated Activity	Status
<b>Federal</b>			
USACOE	Section 404 Wetland Permit	Wetlands impacts and mitigation plan	TBD
	Stream Crossing Approval	CWA may require permit for utility stream crossing navigable waters (33 USC 403).	TBD
U.S. Fish & Wildlife Service	Threatened and Endangered Species Review	Review of agency records for federally threatened or endangered species that may be affected by the proposed pipeline route.	Completed - Verbal comments received 2-26-04

Unit of Govern - ment*	Type of Approval	Regulated Activity	Status
<b>State of Minnesota</b>			
EQB	Gas Pipeline Route Permit and Partial Exemption from Pipeline Route Selection Procedures	Required for gas pipeline >275 psia (pursuant to Minnesota Rules 4415).	Gas Pipeline Route Permit Application submitted 4-30-04 (This document)
SHPO	Cultural Resources Review	Review of agency records for the presence of archaeological, historical or architectural resources that may be affected by the proposed pipeline route.	Completed - Received comment letter dated 1-20-04. Phase I Archaeological Survey completed
MDNR	Minnesota Natural Heritage Database Review	Review of the Minnesota Natural Heritage Information System database for the presence of any rare plant communities or animal species, unique resources, or other significant natural features at or near the site that may be affected by the proposed pipeline route.	Completed - Received comment letter dated 1-12-04
	Water Appropriation Permit (construction dewatering)	Construction dewatering that involves the removal of groundwater exceeding 10,000 gallons per day or 1 million gallons per year.	TBD
MPCA	NPDES/SDS General Stormwater Discharge Permit (MN R100001) for Construction Activities	Stormwater discharges associated with construction activities disturbing 1 or more acres of land.	TBD
	NPDES Discharge Permit for Hydrostatic Testing Water	Discharge of hydrostatic testing water.	TBD
	Section 401 Water Quality Certification	Review and certification of construction activities affecting wetlands requiring a USACOE permit	TBD
MN/DOT	Road Crossing Permit	Required to run gas pipeline under highway (Minnesota Rule 8810).	TBD
	Utility Permit(s)	Utility installation	TBD

Unit of Govern - ment*	Type of Approval	Regulated Activity	Status
<b>Local</b>			
City of Mankato	Utility Construction Permit	Utility Installation	TBD
	Minnesota Wetland Conservation Act Exemption	Exemption from wetland replacement associated with installation of gas pipeline through wetland areas.	TBD
County	Road and Ditch Crossing Permits	Road and Ditch Crossings	TBD
Railroad	Railroad Crossing Permit(s)	Railroad Crossings	TBD

\*Abbreviations:

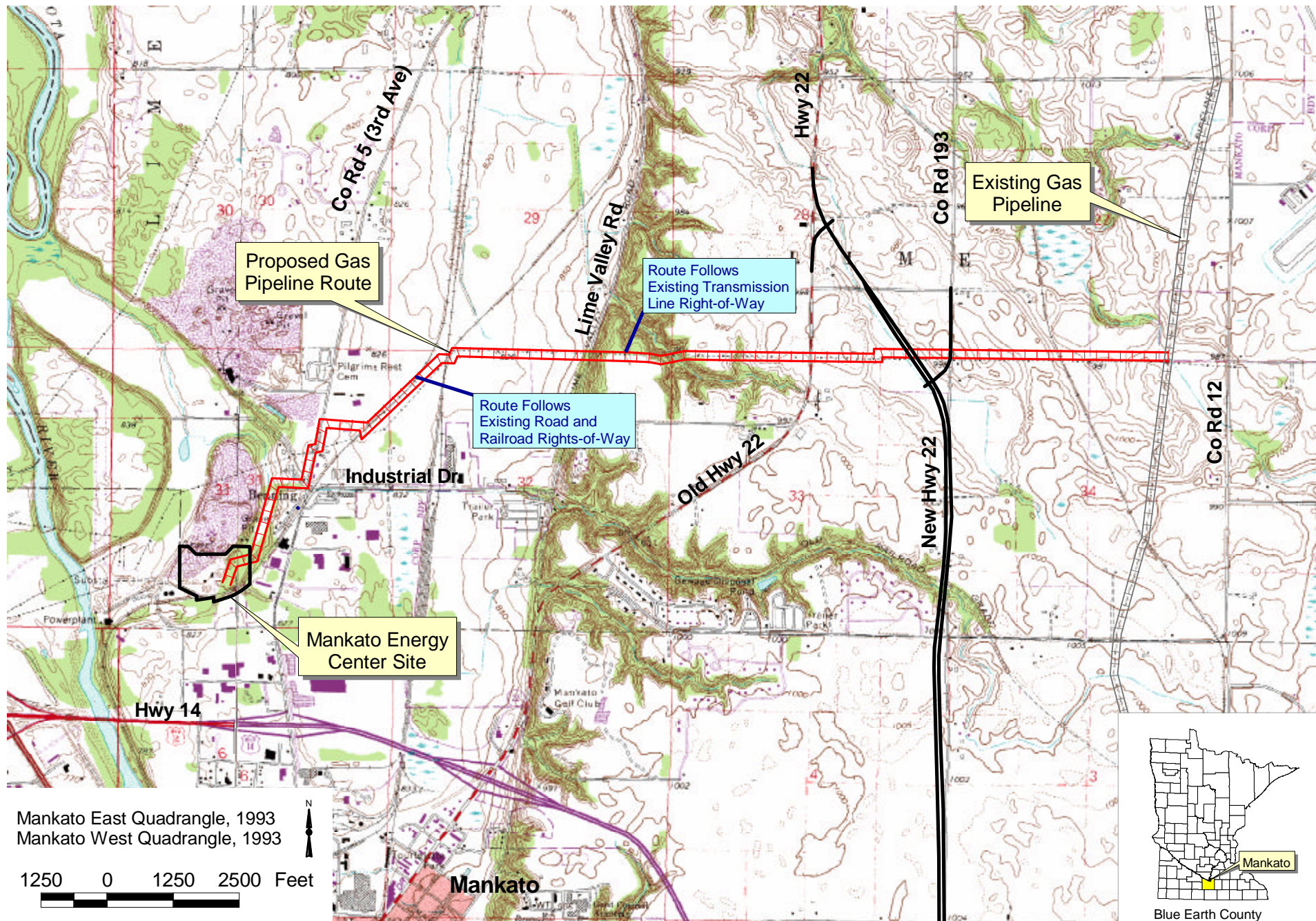
EPA	United States Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
NPDES/SDS	National Pollution Dis charge Elimination System/State Disposal System
SHPO	Minnesota State Historical Preservation Office
TBD	Permit Applicability To Be Determined
USACOE	United States Army Corps of Engineers

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## Figures

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L:\1294\01\07\apr file\pipeline\_may2002\docs.apr\Figure 1: Pipeline with blue text for Bill Wright

## MANKATO ENERGY CENTER - PROPOSED GAS PIPELINE ROUTE

Proposed Natural Gas Pipeline Route

COPYRIGHT

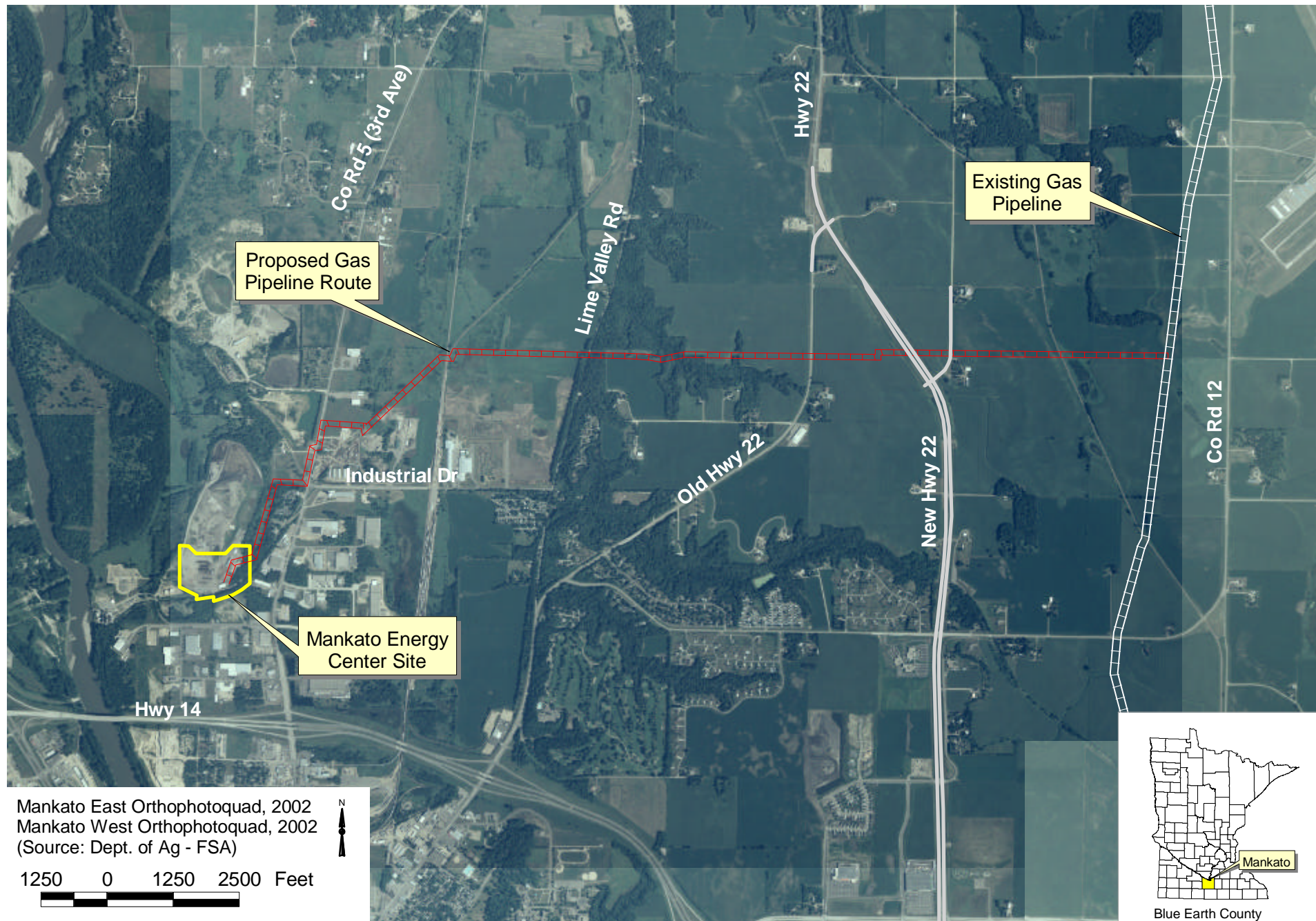
**Wenck**  
 Wenck Associates, Inc.  
 Environmental Engineers

**Wenck**  
 1800 Pioneer Creek Center  
 Maple Plain, MN 55359-0249

APR 2004

Figure 1





L:\1294\01\07\apr file\pipeline\_may2002doqs.apr\Figure 5: 2002 FSA DOQs

## MANKATO ENERGY CENTER - PROPOSED GAS PIPELINE ROUTE

Proposed Natural Gas Pipeline Route

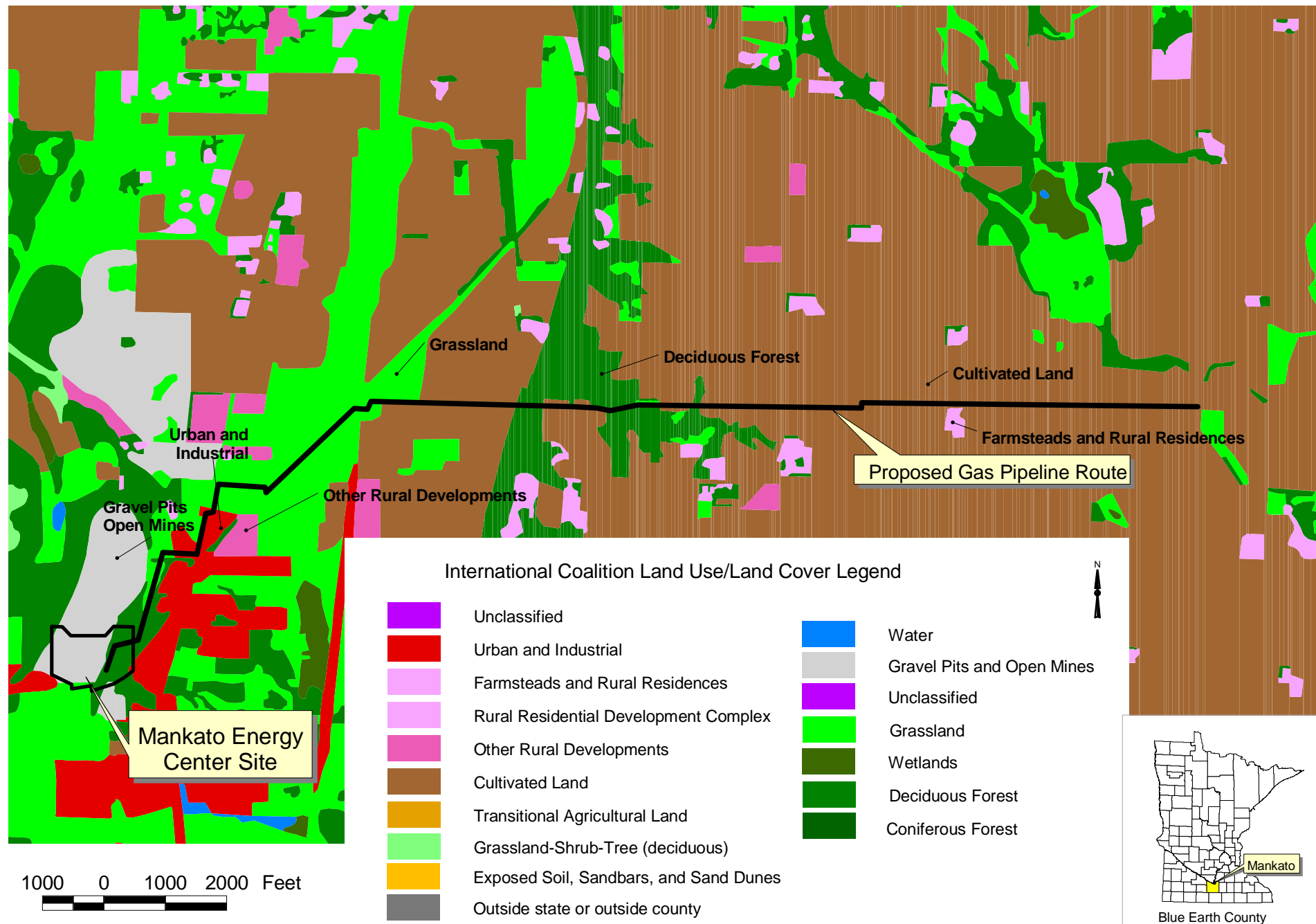
COPYRIGHT

**Wenck**  
Wenck Associates, Inc.  
Environmental Engineers

**Wenck**  
1800 Pioneer Creek Center  
Maple Plain, MN 55359-0249

APR 2004

Figure 2



L:\1294\01\07\apr file\pipeline\_may2002\doqs.apr\Figure 2: IC LU/LC (pipeline Route)

## MANKATO ENERGY CENTER - PROPOSED GAS PIPELINE ROUTE

Land Use

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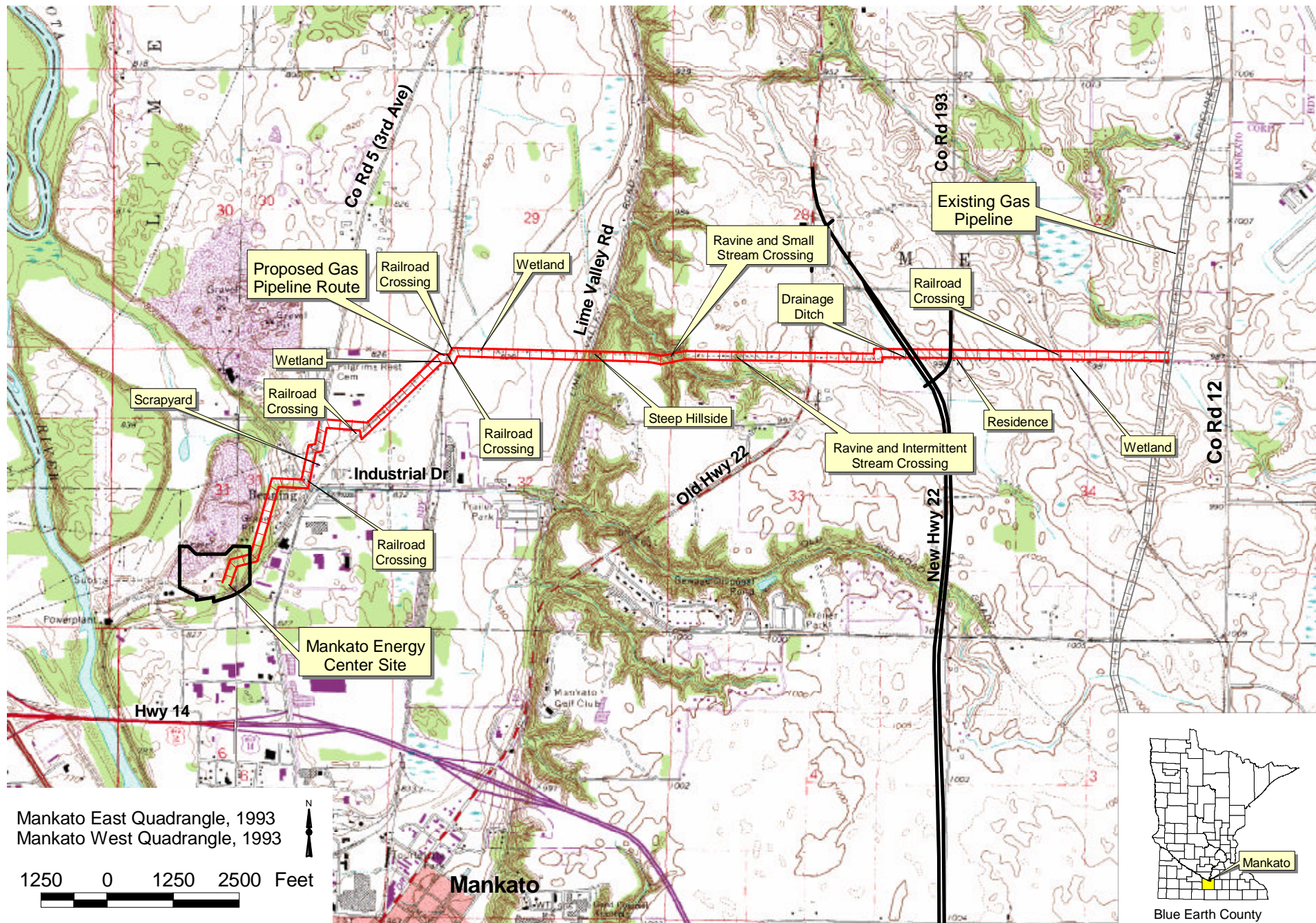


**Wenck**  
1800 Pioneer Creek Center  
Maple Plain, MN 55359-0249

APR 2004

Figure 3





L:\1294\01\07\apr file\site visit.apr\Figure 4: Route Features (Final)

## MANKATO ENERGY CENTER - PROPOSED GAS PIPELINE ROUTE

Proposed Natural Gas Pipeline Route Features

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Maple Plain, MN 55359-0249

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Figure 4

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## **Appendix A**

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### **Material Safety Data Sheet for Methane**

<p style="text-align: center;"><b>MATERIAL SAFETY DATA SHEET</b> <b>Natural Gas</b></p>
---

Northern Natural Gas Company  
1111 S. 103<sup>rd</sup> St.  
Omaha, NE 68124-1000

24 Hr. Company Contact: . . . . . Operations Communication Center - (888) 367-6671

<b>SECTION #1 - IDENTIFICATION</b>
------------------------------------

Product:	Natural Gas
CAS Number:	74-82-8
Chemical Family:	Aliphatic Hydrocarbon, Alkane Series
Synonyms:	Methane, Fuel Gas, Marsh Gas

<b>SECTION #2 - HAZARDOUS CHEMICAL COMPONENTS</b>
---

<u>%</u>	<u>Material</u>	<u>CAS#</u>	<u>Exposure Limit</u>
> 90	Methane	74-82-8	Simple asphyxiant (ACGIH)
< 5	Ethane	74-84-0	Simple asphyxiant (ACGIH)
< 1	Propane	74-98-6	1000 ppm PEL (OSHA) Simple asphyxiant (ACGIH)

This product is hazardous according to OSHA, 29 CFR 1910.1200. This product normally contains no hazardous components, other than ethane, as defined in OSHA 29 CFR §1910.1200 (i.e., greater than 1%). This product may contain small amounts of heavier hydrocarbons. This product and/or components present at concentrations greater than 0.1% are not carcinogenic according to OSHA, IARC, or NTP. Components of this product are normally within the ranges listed above, however, depending on the geographical source, gas composition may vary.

<b>SECTION #3 - PHYSICAL DATA</b>
-----------------------------------

Boiling Point:	-259 F, 162 C
Vapor Pressure:	N/A – Gas
Gas Density (Air = 1)	0.6
Specific Gravity:	N/A – Gas
Solubility (H <sub>2</sub> O):	Very slightly soluble
Evaporation Rate:	Gas at normal ambient conditions
Appearance:	Colorless gas at normal temperature
Odor:	Natural gas is odorless. Various Northern Natural Gas branch lines are odorized. Odorized gas has a rotten egg or garlic type odor.



**SECTION #4 - FIRE FIGHTING & EXPLOSION DATA**

Flash Point:	306 F, 187.8 C
Autoignition:	1004 F, 540 C
Flammable Limits in Air:	5% (lower) 15% (upper)
Unusual Fire and Explosion Hazards:	This gas is extremely flammable and forms flammable mixtures with air. It will burn in the open or be explosive in confined spaces. Its vapors are lighter than air and will disperse. A hazard of re-ignition or explosion exists if flame is extinguished without stopping the gas flow.
Extinguishing Media:	Stop the flow of gas. Dry chemical, CO <sub>2</sub> , or halon. Water can be used to cool the fire but may not extinguish the fire.
Special Fire Fighting Instructions:	Evacuate area upwind of source. Stop gas flow and extinguish fire. If gas source cannot be shut off immediately, equipment and surfaces exposed to the fire should be cooled with water to prevent overheating and explosions. Control fire until gas supply can be shut off.

**SECTION #5 - HEALTH HAZARD DATA**

Exposure Limits:	See Section # 2.
Effects of Single Overexposure:	
Swallowing:	This product is a gas at normal temperature/pressure. No potential for ingestion expected. Solid and liquefied forms of this material and pressurized gas can cause freeze burns.
Skin Absorption:	This material is not expected to be absorbed through the skin. Solid and liquefied forms of this material and pressurized gas can cause freeze burns.
Inhalation:	Exposure may produce rapid breathing, headache, dizziness, visual disturbances, muscular weakness, tremors, narcosis, unconsciousness, and death, depending on the concentration and duration of exposure.
Skin Contact:	Non-irritating, but solid and liquid forms of this material and pressurized gas can cause frostbite, blisters and redness.
Eye Contact:	This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possible permanent eye damage from freeze burns.
Effects of Repeated Overexposure:	
Medical Conditions Aggravated by Overexposure:	Personnel with pre-existing chronic respiratory diseases should avoid exposure to this material.
Emergency and First Aid Procedures:	
Swallowing:	This product is a gas at normal temperature/pressure and not expected to present a swallowing hazard.
Skin:	Frozen tissues should be flooded or soaked with warm water. DO NOT USE HOT WATER. Cryogenic burns that result in blistering or deeper tissue freezing should be promptly seen by a doctor.
Inhalation:	Immediately move personnel to area of fresh air. For respiratory distress, give air, oxygen, or administer CPR (Cardiopulmonary Resuscitation) if necessary. Obtain medical attention if breathing difficulties continue.
Eyes:	Methane gas is not expected to present an eye irritation hazard. If contacted by liquid/solid, immediately flush the eye(s) gently with warm water for at least 15 minutes. Seek medical attention if pain or redness persists.

**SECTION #6 - REACTIVITY & POLYMERIZATION**

Stability:	Stable
Conditions to Avoid:	High heat, open flames and other sources of ignition. Explosive reactions can occur between natural gas and oxidizing agents. Spontaneous ignition with chlorine dioxide.
Incompatibility (materials to avoid):	Barium peroxide, chlorine dioxide and strong oxidizing agents.
Hazardous Combustion or Decomposition Products:	Combustion may produce carbon monoxide, carbon dioxide and other harmful substances.
Hazardous Polymerization:	None

**SECTION #7 - SPILL, LEAK, & DISPOSAL PROCEDURES**

Steps to be Taken in the Event of Spills, Leaks, or Release:	Eliminate all potential sources of ignition. Handling equipment and tools must be grounded to prevent sparking. Evacuate all non-essential personnel to an area upwind. Equip responders with proper protection equipment (as specified in Section # 8) and advise of hazards. Stop sources of release with non-sparking tools before attempting to put out any fire. Ventilate enclosed areas to prevent formation of flammable or oxygen-deficient atmospheres. Water spray may be used to cool equipment or reduce gas accumulation.
Waste Disposal Procedures:	Waste Natural gas in compressed gas cylinders must be disposed of as a hazardous waste.

**SECTION # 8 - SPECIAL PROTECTION MEASURES**

Ventilation:	Local exhaust and general room ventilation may both be essential in work areas to prevent accumulation of explosive mixtures. If mechanical ventilation is used, electrical equipment must meet National Electric Code requirements.
Eye Protection:	Use chemical-type goggles and face shields when handling liquefied gases. Safety glasses and/or face shields are recommended when handling high-pressure cylinders and piping systems or whenever gases are discharged.
Skin Protection:	If there is a potential for contact with high concentrations of compressed gas, use insulated, impervious plastic or neoprene-coated canvas gloves and protective gear (apron, face shield, etc.) to protect hands and other skin areas.
Respiratory Protection:	For excessive gas concentrations, use only NIOSH/MSHA approved, self-contained breathing apparatus.
Work/Hygiene Practices:	Emergency eye wash fountains and safety showers for first aid treatment of potential freeze burns should be available in the vicinity of any significant exposure from compressed gas release. Personnel should not enter areas where the atmosphere is below 19.5 vol. % oxygen without special procedures/equipment. Respirator use should comply with OSHA 29 CFR 1910.134 or equivalent.



**SECTION #9 - SPECIAL PRECAUTIONS - STORAGE & HANDLING**

Storage and Handling Conditions: Store and use cylinders and tanks in well-ventilated areas, away from heat and sources of ignition. No smoking near storage or use. Follow standard procedures for handling cylinders, tanks, and loading/unloading. See NFPA #58 and API 2510. Fixed storage containers must be grounded and bonded during transfer of product.

Naturally Occurring Radioactive Material (NORM): This product may contain Naturally Occurring Radioactive Material (NORM) and customers should be aware of the potential for NORM within their processing system. The actual concentration of NORM in the product is dependent on the geographical source of the natural gas and storage time prior to its delivery. Process equipment (e.g., lines, filters, pumps and reaction units) may accumulate radioactive daughters and emit gamma radiation during operation. Equipment emitting gamma radiation may be presumed to be internally contaminated with alpha-emitting decay products that may be a hazard if inhaled or ingested. Consult applicable NORM regulations for worker protection guidelines and handling requirements before initiating maintenance operations that require opening contaminated equipment.

**SECTION #10 - SHIPPING INFORMATION**

Proper Shipping Name: Methane, Compressed  
Hazard Class: 2.1  
DOT Identification Number: UN1971  
DOT Shipping Label: Flammable Gas (red)

**SECTION #11 - REGULATORY INFORMATION**

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to state and federal reporting requirements. Consult those regulations applicable to your facility or operation.

**Federal Clean Water Act:**

Any spill or release of liquid oils associated with this product into "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802). Also contact appropriate state and local regulatory agencies as required.

**CERCLA Section 103:**

The Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) requires notification to the National Response Center of a release of quantities of Hazardous Substances equal to or greater than the reportable quantities in 40 CFR §302.4. The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts natural gas, natural gas liquids and any indigenous components of such (e.g., benzene) from the CERCLA Section 103 reporting requirements.

**EPCRA Section 304:**

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires emergency planning based on Threshold Planning Quantities and release reporting based on reportable quantities in 40 CFR §355. There are no known components present in this product that would require reporting under this statute.

**EPCRA Sections 311/312:**

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires notification and annual reporting of materials for which maintenance of an MSDS is required. This product is classified under the following hazard categories: Immediate (acute) Health Hazard and Fire Hazard.

**EPCRA Section 313:**

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires submission of annual reports of the release of toxic chemicals that appear in 40 CFR §372. This product contains no chemicals subject to reporting requirements under this statute.

**Toxic Substances Control (TSCA) Status:**

The ingredients of this product are on the TSCA inventory.

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

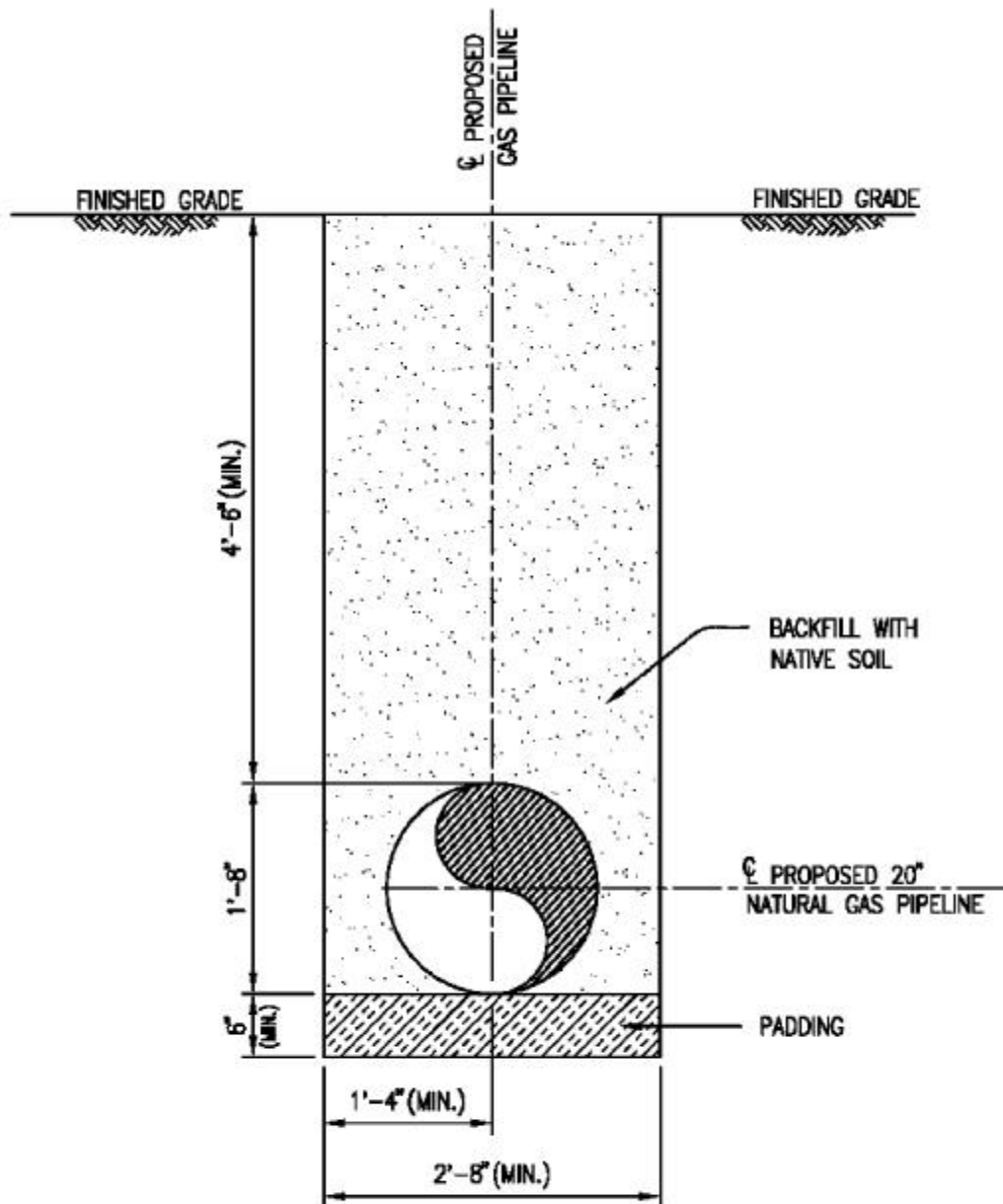
This information relates only to the material designed and may not be valid for such material used in combination with other materials or in any process. Such information is to the best of this Company's knowledge believed accurate and reliable as of the date indicated. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use.

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## **Appendix B**

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### **Typical Trench Detail**



**TYPICAL TRENCH DETAIL**  
SCALE: 3/4" = 1'-0"

L:\1294\01\07\apr file\pipeline\_may2002\doqs.apr\Figure X: Trench Detail

MANKATO ENERGY CENTER  
PROPOSED GAS PIPELINE ROUTE

Typical Trench Detail

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**Wenck**

Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0249

APR 2004

Appendix B

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## **Appendix C**

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### **SHPO Response Letter**



January 20, 2004

MINNESOTA HISTORICAL SOCIETY

RECEIVED BY

JAN 22 2004

Mr. Geoffrey Nash  
Wenck Associates  
PO Box 249  
Maple Plain, MN 55359-0249

WENCK ASSOCIATES, INC.

Re: Natural Gas Pipeline to serve the Calpine Mankato Energy Center  
Blue Earth County  
SHPO Number: 2004-0825

Dear Mr. Nash:

Thank you for consulting with our office during the planning for the above referenced project.

1. We believe that there is a good probability that unreported archaeological properties might be present in the project area. Therefore, we recommend that a survey of the area be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation, and should include an evaluation of National Register eligibility for any properties that are identified. For your information, we have enclosed a list of consultants who have expressed an interest in undertaking such surveys.

If the project area can be documented as previously disturbed or previously surveyed, we will re-evaluate the need for survey. Previously disturbed areas are those where the naturally occurring post-glacial soils and sediments have been recently removed. Any previous survey work must meet contemporary standards.

2. There is one property in our history/architecture inventory (BE-LIM-0003) in the project path, in the northeast quarter of Section 31. The property was inventoried in 1979, but it has not been evaluated, and its current status is unknown. The inventory includes a house and barn. The eligibility of this property, and any other affected buildings and structures along the corridor, will need to be addressed if the project includes federal involvement and is subject to a Section 106 review.

We look forward to working with you as the planning for this project proceeds. Contact us at 651-296-5462 with questions or concerns.

Sincerely,

Dennis A. Gimmetstad  
Government Programs & Compliance Officer

---

## **Appendix D**

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### **Archaeological Survey Report**

**REPORT ON CULTURAL RESOURCE RECONNAISSANCE  
SURVEY**

**CONDUCTED FOR A NATURAL GAS PIPELINE TO SERVE  
THE MANKATO ENERGY CENTER,  
LIME TOWNSHIP,  
BLUE EARTH COUNTY, MINNESOTA**

**Prepared for**

**Wenck Associates, Inc.  
1800 Pioneer Creek Ctr,  
P.O. Box 249  
Maple Plain, MN 55359-0249**

**Prepared by**

**Christina Harrison  
Archaeological Research Services  
1812 15th Avenue South  
Minneapolis, MN 55404-2119  
(612) 870-9775  
April 2004**

**SHPO File Number: 2004-0825**



## CONTENTS

	MANAGEMENT SUMMARY .....	i
1.0	INTRODUCTION .....	1
2.0	DESCRIPTION OF PROJECT AND ENVIRONMENTAL SETTING	
2.1	Proposed Pipeline Route .....	1
2.2	Environmental Setting .....	2
3.0	CULTURAL CONTEXT .....	3
4.0	SURVEY METHODOLOGY AND RESULTS .....	6
5.0	CONCLUSION .....	8
6.0	REFERENCES .....	9

## APPENDICES

Appendix A Project Correspondence

Appendix B View of Railroad Bridge from Proposed Pipeline Route

## FIGURES

- 1 Project Location Map
- 2 Proposed Natural Gas Pipeline Route

## MANAGEMENT SUMMARY

In order to meet projected regional energy needs, Mankato Energy Center, LLC is proposing to construct a 3.7 mile natural gas pipeline to serve its proposed 630-megawatt power plant, both to be located in Lime Township (T109N, R26W), Blue Earth County, Minnesota (Figure 1).

From an existing natural gas pipeline a short distance west of County Road 12, the proposed pipeline route follows an Xcel Energy 115kV line right-of-way along the northern edges of Sections 34, 33 and 32 before veering southwest through the northwest quarter of Section 32 and the northeast quarter of Section 31 as far as County Road 5 (Third Avenue). West of this road, it leaves the transmission line to run south along the western side of the road and then southwest along an abandoned railroad that leads to the power plant location (Figure 2).

The permanent easement for the proposed pipeline will be limited to a width of 50 feet. Another 25 feet of temporary easements will be needed to accommodate vehicles during construction.

The first two miles of proposed pipeline route traverse level to gently rolling uplands east of the Minnesota River valley. With the exception of two smaller wetlands, a steep-sided tributary ravine and the four points where the route crosses a railroad, a gravel drive, and new as well as old State Highway 22, all lands within the proposed pipeline corridor are under active cultivation. Below the steep, wooded bluffslope, the route traverses a quarter mile of cultivated valley floor, then a stretch of low and marshy terrain which continues to flank the route as it follows the powerline southwest to the industrial area along County Road 5 and Industrial Drive. For the most part deeply disturbed, this area lacks archaeological potential, as does the last segment of proposed pipeline easement, which follows existing road and railroad right-of-way.

\*\*\*

Part of the Minnesota Valley Outwash region, the river bottomlands feature nearly level terraces formed by glacial outwash which, in some areas, is deep enough to provide rich sources of gravel, but elsewhere often is quite shallow, barely covering benches of limestone or sandstone bedrock (University of Minnesota Agricultural Experiment Station 1973:10). As proposed, the pipeline route traverses areas typical of both formations, ending by the power plant location on a north-trending lobe of gravely terrace that is bounded, on the west, by an abandoned channel of the Minnesota River and, on the east and north, by the valley of a small tributary stream (Figure 2). The terrace has, at this point, been extensively mined for gravel and does not retain any undisturbed postglacial soils.

The uplands east of the river valley are part of the Waconia-Waseca Moraine -- a geomorphic area characterized by loam-mantled moraines and shallow ice disintegration features that now contain marsh vegetation or open water (ibid. page 14).

At the time of the original land survey, the uplands were covered with hardwood forest while prairie grasses were predominant on the sandy and gravelly valley floor. During warmer and dryer phases of the post-glacial period, prairie would have been more extensive and tree cover limited to protected areas along the river.

\*\*\*

Wenck Associates, Inc. are currently preparing a gas pipeline application to be submitted the Environmental Quality Board for this undertaking. Asked to comment on the proposed pipeline route, the State Historic Preservation Office (SHPO) recommended that an archaeological survey be conducted within the study area. In a letter dated January 20, 2004 (Appendix A), SHPO states that the survey should meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation and should include an evaluation of National Register eligibility for any archaeological properties identified in the study area. If, in addition, any future federal involvement with the project should make it subject to review under Section 106 of the National Historic Preservation Act of 1966 (and in accordance with 36FR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties), it may also be necessary to identify and evaluate the National Register eligibility of any historic structures within the project area.

During the month of April, 2004, Archaeological Research Services (ARS) was retained by Wenck Associates to conduct the recommended survey. Following a records and literature search, the field inspection was conducted on April 14, 2004, by Christina Harrison, principal investigator, and John Strot, research assistant.

The Mankato area is located within the eastern part of the Prairie Lakes Archaeological Region (Anfinson 1990). According to inventory records and survey files maintained for this region at the Minnesota Historical Society and the Office of the State Archaeologist, a number of cultural resources have previously been identified in the general project area, including:

- Historic farmsteads associated with the period of initial Euroamerican settlement.
- Archaeological sites associated with nearly 10,000 years of Native American presence along the Minnesota River and its tributaries -- burial and camp sites prominently located on the bluff tops as well as, in the valley, habitation and special activity areas associated with the use of riverine food resources and the processing of local cherts into stone tools.

The ARS survey team then inspected the entire pipeline corridor along transects walked at six meter intervals, each transect with a lateral coverage of three-four meters. As all segments offered excellent surface exposure and had been deeply disturbed either by decades of cultivation or by industrial development, visual inspection was considered sufficient and supplementary shovel testing unnecessary.

In spite of its apparent archaeological potential, the surveyed areas did not yield any archaeological evidence -- a fact that warrants some comments:

- Although an interview with a long-time resident indicated that he had found Native American projectile points on a cultivated bluff top adjacent to a tributary ravine some 200 meters south of the pipeline route, there was no trace of such evidence within the surveyed area in spite of nearly 100% visibility all across deeply disturbed, fall-cultivated and rain-washed soils. As the route crosses the bluff approximately halfway between the above-mentioned find area and another bluff spur that overlooks a deep tributary ravine -- prominent settings which, judging by archaeological inventory records, generally are more likely than most to have attracted Native American use -- one can assume that the surveyed area simply was a rarely if ever used portion of the bluff zone.
- Approximately a mile east of the river bluffs, the pipeline route crosses a wetland which is drained by a minor tributary to the Minnesota River. Nearly 500 meters further south, archaeological site 21 BE 267 was recorded as a small scatter of lithic chipping debris found on a level-crested cultivated ridge adjacent to the same wetland. Considering that the terrain inspected by the ARS survey team adjacent to this wetland features nothing but consistent slope, it would have been much less likely to attract Native American habitation.
- Although the valley floor that is traversed by the pipeline route features several areas of exposed bedrock, there was no evidence of Native American efforts to locate and process lithic raw materials. Closer to the river, where camps and activity areas may have been associated with riverine food procurement, all post-glacial soils have been too deeply altered by industrial development or road and railroad construction to retain any archaeological research potential.

The SHPO history/architecture inventory lists a historic farmstead (BE-LIM-003) for the northeastern quadrant of Section 31. As currently proposed, the pipeline route runs approximately 200 meters east of that property which therefore will not be affected by the proposed undertaking.

Another historic structure was identified by ARS near the southwestern terminus of the route: a wooden railroad bridge which rests on well preserved footings of dressed limestone at the point where the abandoned railroad crosses a tributary creek (Appendix B). As the proposed pipeline would be buried along the railroad right-of-way but well to the side of the embankment, it would not physically or visually impact the bridge structure and no further Section 106 review is warranted.

Briefly summarized, the negative results of this survey indicate that the proposed undertaking would not adversely impact any significant cultural resources.

## **1.0 INTRODUCTION**

In order to meet projected regional energy needs, Mankato Energy Center, LLC is proposing to construct a 3.7 mile natural gas pipeline to serve a 630-megawatt power plant, both to be located in Lime Township (T109N, R26W), Blue Earth County, Minnesota (Figure 1). Wenck Associates, Inc. is presently preparing a gas pipeline application to be submitted the Environmental Quality Board for this undertaking.

The first two miles of proposed pipeline route traverse level to gently rolling uplands east of the Minnesota River valley. Below the steep, wooded bluffslope, the route continues west and southwest across the valley floor towards the river (Figure 2).

A number of Native American and early Euroamerican cultural resources have been recorded along the valleys and bluffs of the Minnesota River and its tributaries. Asked to comment on the proposed pipeline route, the State Historic Preservation Office (SHPO) recommended that an archaeological survey be conducted within the study area. In a letter dated January 20, 2004, SHPO states that the survey should meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation and should include an assessment of National Register eligibility for any archaeological properties identified in the study area (Appendix A). If, in addition, any future federal involvement with the project should make it subject to review under Section 106 of the National Historic Preservation Act of 1966 (and in accordance with 36FR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties), it may also be necessary to identify and evaluate the National Register eligibility of any historic structures within the project area.

During the month of April, 2004, Archaeological Research Services (ARS) was retained by Wenck Associates to conduct the recommended survey. Following a records and literature search, the field inspection was conducted on April 14, 2004, by Christina Harrison, principal investigator, and John Strot, research assistant.

## **2.0 DESCRIPTION OF PROJECT AND ENVIRONMENTAL SETTING**

### **2.1 Proposed Pipeline Route**

From an existing natural gas pipeline a short distance west of County Road 12, the proposed pipeline route follows an Xcel Energy 115kV line right-of-way along the northern edges of Sections 34, 33 and 32 before veering southwest through

the northwest quarter of Section 32 and the northeast quarter of Section 31 as far as County Road 5 (Third Avenue). West of this road, it leaves the transmission line to run south along the western side of the road and then southwest along an abandoned railroad that leads to the power plant location (Figure 2).

The permanent easement for the proposed pipeline will be limited to a width of 50 feet. Another 25 feet of temporary easements will be needed to accommodate vehicles during construction.

The uplands east of the valley are level to gently rolling. Most lands within the proposed pipeline corridor are under active cultivation, the exceptions being two smaller wetlands, a steep-sided tributary ravine and four points where the route crosses a railroad, a gravel drive, and new as well as old State Highway 22.

Below the steep, wooded bluffslope, the route traverses a quarter mile of cultivated valley floor, then a stretch of low and marshy terrain which continues to flank the route as it follows the powerline southwest to the industrial area along County Road 5 and Industrial Drive. For the most part deeply disturbed, this area lacks archaeological potential, as does the last segment of proposed pipeline easement, which follows existing road and railroad right-of-way.

## **2.2 Environmental Setting**

Part of the Minnesota Valley Outwash region, the river bottomlands feature nearly level terraces formed by glacial outwash which, in some areas, is deep enough to provide rich sources of gravel, but elsewhere often is quite shallow, barely covering benches of limestone or sandstone bedrock (University of Minnesota Agricultural Experiment Station 1973:10). As proposed, the pipeline route traverses areas typical of both formations, ending by the power plant location on a north-trending lobe of gravelly terrace that is bounded, on the west, by an abandoned channel of the Minnesota River and, on the east and north, by the valley of a small tributary stream (Figure 2). The terrace has, at this point, been extensively mined for gravel and does not retain any undisturbed postglacial soils.

The uplands east of the river valley are part of the Waconia-Waseca Moraine -- a geomorphic area characterized by loam-mantled moraines and shallow ice disintegration features that now contain marsh vegetation or open water (ibid. page 14).

At the time of the original land survey in the mid-1800s, the uplands were covered with hardwood forest while prairie grasses were predominant on the sandy and gravelly valley floor. During the earlier postglacial period, however, this region underwent a succession of vegetational changes, from tundra and boreal forest to open parkland and even, during the warm and dry conditions of the altithermal period, open prairie. Then, with the return of cooler climatic conditions

during the last few millennia prior to Euroamerican settlement, prairie grasses remained predominant on the well drained outwash soils of the main river terraces, while the wetter soils of the river bottoms supported marsh grasses and hardwoods (elm, ash, cottonwood, basswood, boxelder, soft maple, willow and hackberry) and the uplands along the river valley were covered with either “big woods” (primarily oak, elm, basswood, ash and maple) or oak savanna (Marschner 1974).

With river bottom forest in the valley, tall grass prairie to the west and south, as well as big woods to the north and east, there was a great diversity of flora and fauna around the study area -- a variety which would have made the region very attractive to Native American groups throughout most of the postglacial period.

### **3.0 CULTURAL CONTEXT**

During the late 1800s, a number of archaeological sites -- mostly mounds or mound groups -- were identified in the state by professional surveyors and geologists, particularly along major waterways like the Minnesota River with tributaries (Winchell 1911). Few additional sites were recorded in the decades that followed. Since the 1970s, however, with an increasing emphasis on the legal protection of historic sites and the professional identification and management of such cultural resources, compliance surveys have added a number of new properties to the Minnesota inventories of archaeological sites and standing historic structures.

Well over 300 archaeological sites have been reported so far in Blue Earth County which is located in the Prairie Lakes Archaeological Region (Anfinson 1990). More than 260 of them have been assigned formal site numbers while the rest need further field verification. A majority are located within or near the Minnesota River valley or along the lower reaches of its tributaries. Others are clustered around larger lakes. Along with sites identified in the neighboring counties of Le Sueur, Brown and Nicollet, they provide a record of approximately 10,000 years of human use of this region -- a record of past cultural development which, so far, is somewhat sketchy as much of the information derives from surface finds and preliminary surveys rather than excavated contexts. The following summary is based, in part, on information from several fairly recent reports for this area -- information compiled, in turn, from other archaeological writings for the region, primarily the reports on various compliance investigations (Dudzik 1994; Skaar 1993a; Strachan and Roetzel 1992).

The **Paleoindian and Early Archaic periods** (ca. 10,000 to 3000 B.C.) were characterized by small, mobile hunting societies with a subsistence economy focused on the hunting of large game like bison as well as on smaller game, fish and plant resources. Throughout the first few millennia, there was a distinct



warming and drying trend that followed the disappearance of the glaciers and culminated with the altithermal period. During the latter, open grasslands dominated the landscape of the eastern Prairie Lakes region. Most distinctive in the lithic tool kits of this time were large, well made, lanceolate bifaces used as projectile points and cutting implements; other items include other large, bifacially flaked knives and choppers as well as scrapers and more expedient tools made, with a minimum of modification, from large flakes. Within this region, Paleoindian/Early Archaic evidence is generally limited to surface finds of diagnostic points.

**Middle-Late Archaic** groups (ca. 3000 to 200 B.C.) continued to rely on bison hunting but also developed an increasingly diverse technology for activities such as hunting, trapping, fishing, foraging and the processing of wood, fiber and edible plants. Economic diversification and regionalized adaptation to a greater variety of local environments continued throughout the period as the climate changed back to cooler, wetter conditions. Chipped lithics continue to dominate the tool assemblages but with distinctive changes in the morphology of diagnostic, dateable items such as projectile (dart) points -- now smaller and stemmed or side-notched. In addition, however, there is now increasing evidence of pecked and ground stone implements such as hammers and grindstones. Native copper, hammered into a variety of implements and ornaments, is found in Late Archaic contexts. Generally speaking, Middle-Late Archaic sites are more common than those of previous periods -- an apparent indication of increasing population density. Within the general study area and surrounding portions of the eastern Prairie Lakes region, however, evidence remains scarce but the archaeological inventory includes a number of "lithic scatters" that, if subjected to intensive data recovery, could prove to be Archaic.

The transition from the Archaic to the **Woodland period** (ca. 200 B.C. to at least A.D. 900) added some significant traits to the cultural inventory: the manufacturing of ceramic vessels, the construction of burial mounds and, in parts of the upper Midwest and to varying degree, the beginning of horticulture. Within the study region, where the Woodland period is divided into an Initial and a Terminal stage, there appears to have been little change in subsistence strategies but certain technological refinements seem to have increased their efficiency, such as adoption of the bow and arrow. Hundreds of Woodland sites have been identified within the Prairie Lakes region, mostly along the margins of lakes and rivers. The greatest density, so far, appears to be within Blue Earth, Nicollet, and Brown Counties, primarily along the Minnesota River and its Blue Earth River, Cottonwood River and Swan Lake-Nicollet River tributary drainages.

While Late Woodland groups appear to have lingered on in the hinterlands, new cultural patterns began to emerge along the major river valleys of the region around A.D. 900. Between that time and the period of initial Euroamerican contact in the 1600s, the valleys of the Mississippi and Minnesota Rivers and their tributaries were characterized by significantly different cultural

manifestations: the **Plains Village and Oneota traditions**. The former related to similar complexes along the Missouri River, the latter to Mississippian groups further east. Both, however, represented a shift in subsistence and settlement patterns to horticultural use of the river bottoms (in addition to continued hunting and gathering) and more sedentary life in larger, permanent or semi-permanent villages (Anfinson 1997; Dobbs 1984; Dobbs and Shane 1983). Ceramics differ from previous Woodland types in form, decoration and type of temper. The archaeological evidence reflects these changes with large storage pits, organically enriched house floors with post molds, gardening implements like scapula hoes, charred beans or corn kernels and other items that reflect a more sedentary, horticultural life style. None of these sites have been found in the immediate vicinity of the study area.

During the early contact period (beginning in the mid-1600s), the region was occupied by **Yankton Dakota** groups who still could rely on the large bison herds of the prairies south and west of the Minnesota River. They were followed by the **Wahpeton and Sisseton bands of the Eastern Dakota**. By the early 1700s, a major Sisseton band had established a village at Traverse the Sioux ("Oiyuwega", a Dakota word for "crossing"). This point, 60 miles upstream from the Mississippi/Minnesota River confluence and less than fifteen miles downstream from present day Mankato, had long been used as a convenient place to ford the river during travel along a major overland trail that connected the prairies of the west/southwest (and important sites like the sacred quarry at Pipestone) with the forests and rich river valleys to the east/southeast and the Mississippi River region.

The wildlife of the big woods, abundant with bear, beaver, deer, mink, otter and badger, along with a hungry world market for furs, also brought **trappers and fur traders** to the area: first the French, then the English and finally the Americans. Already in the late 1600s, Pierre Le Sueur was active in the area around the Minnesota, Blue Earth and Le Sueur Rivers and others soon followed. Before long, trade became an integral part also of the Dakota subsistence pattern. The Mankato and Traverse des Sioux communities were also in early contact with missionaries.

Traverse des Sioux, located some ten miles downstream from the project area, came to be an important meeting point between different Dakota groups as well as between Indians and non-Indians -- the site of a number of important councils and, finally, also of the negotiations for and signing of the 1851 treaty that ceded most of the Dakota lands of present day Minnesota to the United States government. With this document, the southern part of the future state was opened up for settlement, official land surveys could begin and, by 1853, Fort Ridgely had been built on the Minnesota River at the western end of Nicollet County as part of an effort to protect the western frontier.

Following this land cession, **Euroamerican settlers and land speculators** swarmed into the area -- a development which suffered a brief setback a decade later during the Dakota Conflict but then continued at a fast pace following the Civil War.

\*\*\*

According to inventory records and survey files maintained at the Minnesota Historical Society and the Office of the State Archaeologist, a number of cultural resources have previously been identified in the general project area, including:

- Historic farmsteads associated with the period of initial Euroamerican settlement.
- Archaeological sites associated with nearly 10,000 years of Native American presence along the Minnesota River with tributaries -- burial and camp sites prominently located on the bluff tops as well as, in the valley, habitation and special activity areas associated with the use of riverine food resources and the processing of local cherts into stone tools (Harrison 1995 and 1996).

Two precontact and one postcontact period archaeological sites have been recorded within one mile of the project area:

21 BE 155 -- a lithic scatter of unknown date and cultural affiliation found on a bluff top by a tributary ravine a mile to the north;

21 BE 252 -- a historic foundation and artifact scatter nearly a mile to the south, in a similar setting along the south side of a ravine;

21 BE 267 -- a small scatter of lithic chipping debris found approximately a mile east of the river bluffs and a quarter mile south of the pipeline route on a level-crested cultivated ridge that overlooks a wetland which is drained by a minor tributary to the Minnesota River.

In addition to the archaeological sites, the SHPO history/ architecture inventory lists a historic farmstead (BE-LIM-003) for the northeastern quadrant of Section 31 next to the Xcel powerline.

#### **4.0 SURVEY METHODOLOGY AND RESULTS**

Survey conditions were excellent as the ARS survey team inspected the pipeline corridor along transects that were walked at six meter intervals, each transect with a lateral coverage of three-four meters. Deeply disturbed, either by decades of cultivation or by industrial development, and then well weathered and washed by fall, winter and spring precipitation, all inspected areas featured 80-90% surface exposure. In addition to plow disturbance, there were also numerous

other subsoil exposures caused by animal burrowing, rainwater gullying and slope erosion. As complete visual inspection of all disturbances more than averaged the subsoil exposure provided by conventional shovel testing, visual inspection was considered sufficient and supplementary testing unnecessary.

For ease of reference, survey observations and results were recorded and plotted by segments as shown in Figure 2.

All of Segment A traversed very rolling terrain with excellent exposure on hill crests and upper slopes. Results proved negative in spite of the known nearby presence of archaeological site 21 BE 267 on a ridge adjacent to a wetland that is drained by a minor tributary to the Minnesota River. Considering, however, that the terrain inspected by the ARS survey team at the northern end of the same wetland features nothing but consistent slope, it would have been much less likely to attract Native American habitation.

Segment B, between old and new Highway 22, and Segment C, from old Highway 22 west to a deep tributary ravine, both featured harvested soybeans and 85-90% surface visibility. Again, results proved negative.

Segment D -- a narrow, deep ravine -- featured very steep slopes without any archaeological potential. The bluff tops on either side have been deeply disturbed by the footings for twin powerline poles as well as massive bioturbation. All disturbances were inspected with negative results.

Segment E, a level-crested, cultivated upland between the ravine and the main river bluff, provided excellent exposure between sparse rows of corn stubble on the deeply disturbed, fall-cultivated and rain-washed soil. Although an interview with a long-time resident indicated that he had found Native American projectile points on a cultivated bluff top adjacent to a tributary ravine some 200 meters south of the pipeline route, there was no trace of such evidence within the surveyed area in spite of nearly 100% visibility. As the route crosses the bluff approximately halfway between the above-mentioned find area and another bluff spur that overlooks a deep tributary ravine -- prominent settings which, judging by archaeological inventory records, generally are more likely than most to have attracted Native American use -- one can assume that the surveyed area simply was a rarely if ever used portion of the bluff zone.

Segment F -- a gradually westward sloping intermediate terrace between the base of the bluff and lower, wetter Segment G -- had all been fall-cultivated and then rained on. In spite of excellent visibility, the results proved negative.

Segment G, with its low, brushy, wet and spongy ground, appeared totally lacking in archaeological potential.

In Segment H, the proposed pipeline will veer southwest across terrain that at first is wet and marshy, but then rises a few feet above water with scattered large boulders and intermittently exposed bedrock. Numerous deep disturbances caused by all-terrain vehicles, bioturbation, and pulled brush were all inspected and found negative.

Although the valley floor that is traversed by the pipeline route features several areas of exposed bedrock, there is no evidence of Native American efforts to locate and process lithic raw materials. Closer to the river, in Segment I, where camps and activity areas may have been associated with riverine food procurement, all post-glacial soils have been too deeply altered by industrial development or road and railroad construction to retain any archaeological research potential.

Segment J, which follows the western side of County Road 5, and Segment K, which continues along the embankment of an abandoned road, have both been completely disturbed well into sterile glacial soil and lack archaeological potential.

As currently proposed, the pipeline route runs approximately 200 meters east of the previously mentioned historic farmstead (BE-LIM-003). This property will therefore not be affected by the proposed undertaking.

Another historic structure was identified by ARS near the southwestern terminus of the route: a wooden railroad bridge which rests on well preserved footings of dressed limestone at the point where the abandoned railroad crosses a tributary creek (Appendix B). As the proposed pipeline would be buried along the railroad right-of-way but well to the side of the embankment, it would not physically or visually impact the bridge structure and no further Section 106 review is warranted.

## **5.0 CONCLUSION**

Briefly summarized, the negative results of this survey indicate that the proposed undertaking would not adversely impact any significant cultural resources.

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# **APPENDIX A**

## **Project Correspondence**





January 20, 2004

MINNESOTA HISTORICAL SOCIETY

RECEIVED BY

JAN 22 2004

Mr. Geoffrey Nash  
Wenck Associates  
PO Box 249  
Maple Plain, MN 55359-0249

WENCK ASSOCIATES, INC.

Re: Natural Gas Pipeline to serve the Calpine Mankato Energy Center  
Blue Earth County  
SHPO Number: 2004-0825

Dear Mr. Nash:

Thank you for consulting with our office during the planning for the above referenced project.

1. We believe that there is a good probability that unreported archaeological properties might be present in the project area. Therefore, we recommend that a survey of the area be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation, and should include an evaluation of National Register eligibility for any properties that are identified. For your information, we have enclosed a list of consultants who have expressed an interest in undertaking such surveys.

If the project area can be documented as previously disturbed or previously surveyed, we will re-evaluate the need for survey. Previously disturbed areas are those where the naturally occurring post-glacial soils and sediments have been recently removed. Any previous survey work must meet contemporary standards.

2. There is one property in our history/architecture inventory (BE-LIM-0003) in the project path, in the northeast quarter of Section 31. The property was inventoried in 1979, but it has not been evaluated, and its current status is unknown. The inventory includes a house and barn. The eligibility of this property, and any other affected buildings and structures along the corridor, will need to be addressed if the project includes federal involvement and is subject to a Section 106 review.

We look forward to working with you as the planning for this project proceeds. Contact us at 651-296-5462 with questions or concerns.

Sincerely,

Dennis A. Gimmetstad  
Government Programs & Compliance Officer

## **APPENDIX B**

### **View of Railroad Bridge from Proposed Pipeline Route**



L:\1294\01\07\apr file\ars\_support.apr\Figure Appendix B

**MANKATO ENERGY CENTER**

View of Railroad Bridge  
from Proposed Pipeline Route

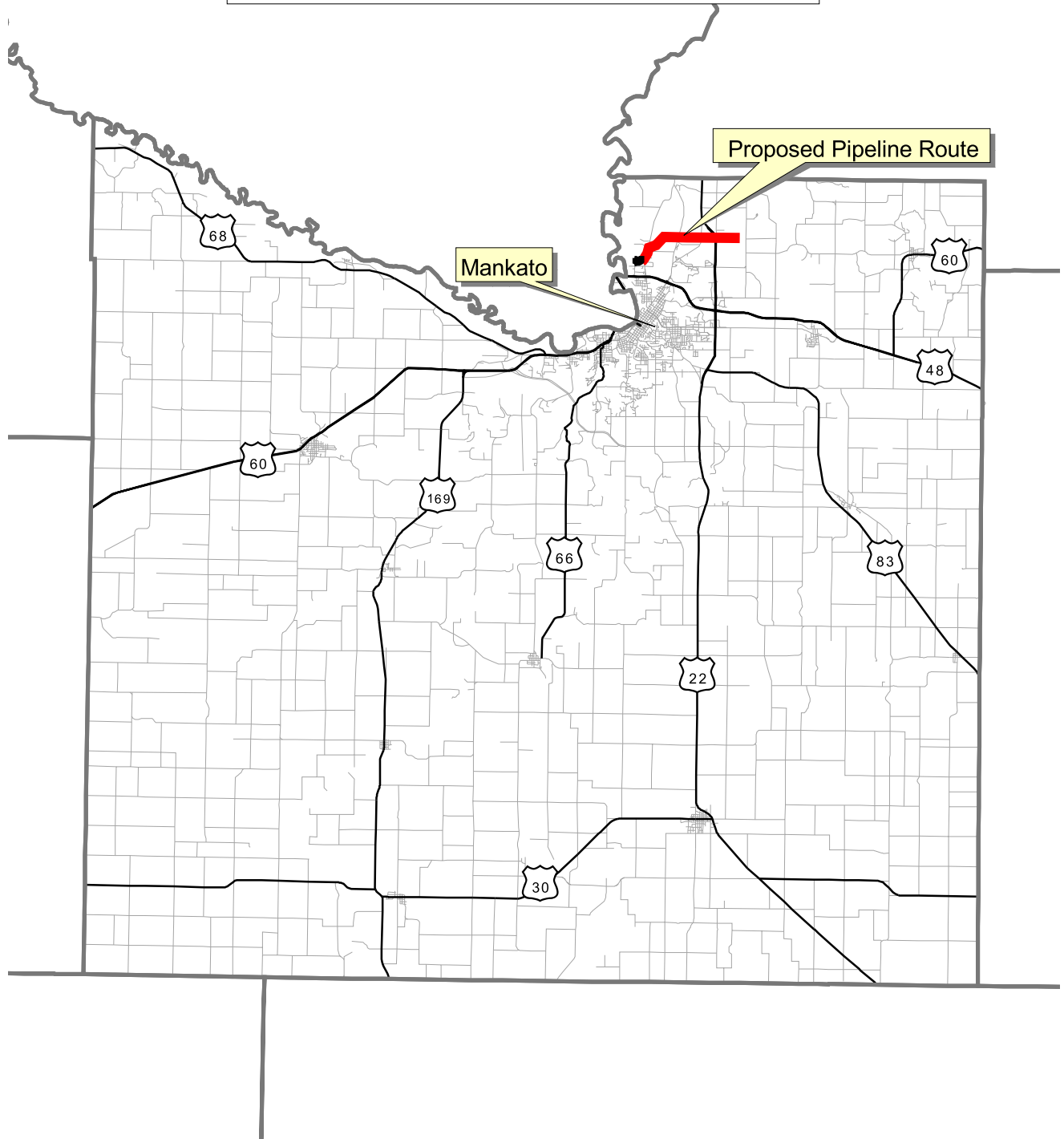
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**Wenck**  
 Wenck Associates, Inc. 1800 Pioneer Creek Center  
 Environmental Engineers Maple Plain, MN 55359-0249

APR2004

Appendix B

# FIGURES

# Blue Earth County



3 0 3 6 Miles



L:\1294\01\07\april\support.apr\Figure 1: Blue Earth Co with pipeline

MANKATO ENERGY CENTER

Project Location Map

COPYRIGHT



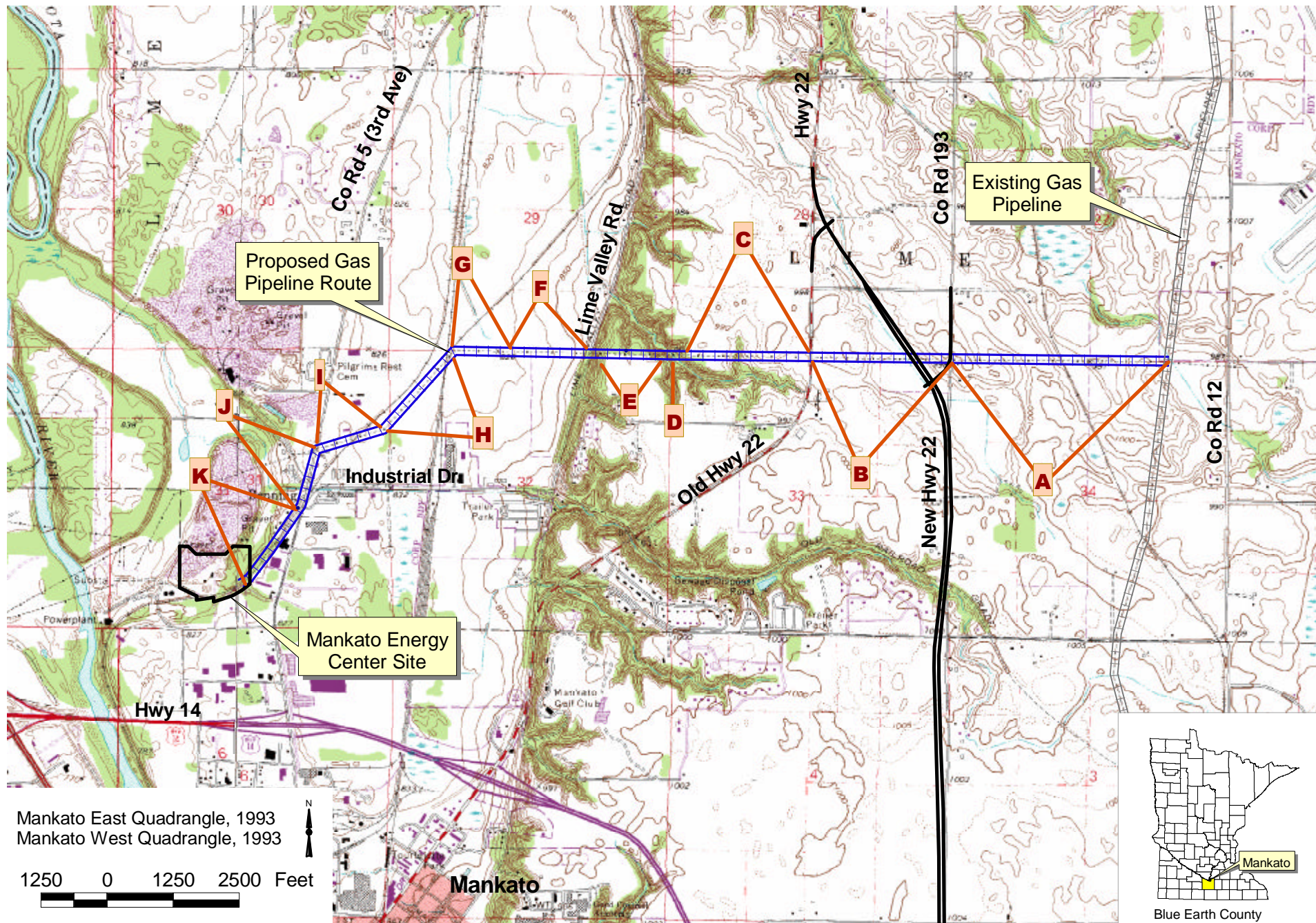
**Wenck**

Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0249

APR 2004

Figure 1





L:\1294\0107\apr file\ars\_support.apr\Figure 2: Pipeline with ARS notes

## MANKATO ENERGY CENTER

Proposed Natural Gas Pipeline Route

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Environmental Engineers

**Wenck**

1800 Pioneer Creek Center  
Maple Plain, MN 55359-0249

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Figure 2

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## **Appendix E**

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### **Minnesota Department of Natural Resources Response Letter**





## Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-40

Phone: (651) 296-7863 Fax: (651) 296-1811 E-mail: sarah.hoffmann@dnr.state.mn.us

RECEIVED BY

JAN 13 2004

WENCK ASSOCIATES, INC.

January 12, 2004

Geoffrey H. Nash  
Wenck Associates, Inc.  
P.O. Box 249  
Maple Plain, MN 55359

Re: Request for Natural Heritage information for vicinity of proposed Calpine Mankato Energy Center Pipeline, T109N R26W Sec. 27-29 & 31-34, Blue Earth County  
NHNRP Contact #: ERDB 20040172-002

Dear Mr. Nash,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 14 known occurrences of rare species or natural communities in the area searched (for details, see enclosed database printout and explanation of selected fields). However, based on the nature and location of the proposed project I do not believe it will affect any known occurrences of rare features.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Blue Earth County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: index and full record. To control the release of locational information which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The index provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index for any other purpose, please contact me to request written permission. Copyright notice for the index should include the following disclaimer:

"Copyright (year) State of Minnesota, Department of Natural Resources. This index may be reprinted, unaltered, in Environmental Assessment Worksheets, municipal natural resource plans, and internal reports. For any other use, written permission is required."

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The full-record printout includes more detailed locational information, and is for your personal use only. If you wish to reprint the full-record printouts for any purpose, please contact me to request written permission.

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other wildlife-related issues, you may contact your Regional Environmental Assessment Ecologist, Shannon Fisher, at (507) 359-6073.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

*Chandria Carter for*

Sarah D. Hoffmann  
Endangered Species Environmental Review Coordinator

encl: Database search results  
Rare Feature Database Print-Outs: An Explanation of Fields  
Invoice

Minnesota Natural Heritage Database  
Element Occurrence Records

CALPINE MANKATO ENERGY CENTER PIPELINE  
T109N R26W SEC. 27-29 & 31-34, BLUE EARTH COUNTY  
MnDNR, Natural Heritage and Nongame Research Program

14:46 Wednesday, JANUARY 07, 2004  
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MANAGED AREA

TWP	RNG	PRIMARY SECTION	FED STATUS	MN STATUS	S RANK	ELEMENT and OCCURRENCE NUMBER
T108N	R26W	06		SPC		COLUBER CONSTRICTOR (RACER) #50
T108N	R27W	01		NON		ELAPHE VULPINA (FOX SNAKE) #165
T109N	R26W	19		SPC		CYPRIPEDIUM CANDIDUM (SMALL WHITE LADY'S-SLIPPER) #10
T109N	R26W	19		THR		LANIUS LUDOVICIANUS (LOGGERHEAD SHRIKE) #166
T109N	R26W	20		SPC		COLUBER CONSTRICTOR (RACER) #51
T109N	R26W	20		NON		ELAPHE VULPINA (FOX SNAKE) #149
T109N	R26W	20		NON		ELAPHE VULPINA (FOX SNAKE) #173
T109N	R26W	31			S1	MESIC PRAIRIE (SOUTHEAST) #38
T109N	R27W	25			S3	FLOODPLAIN FOREST SILVER MAPLE SUBTYPE #64
T109N	R27W	36		NON		ELAPHE VULPINA (FOX SNAKE) #164
T109N	R27W	36	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1380
T109N	R27W	36				MUSSEL SAMPLING SITE #121
T109N	R27W	36		THR		POLYODON SPATHULA (PADDLEFISH) #6
T109N	R27W	36		NON		SCAPHIRYNCHUS PLATORYNCHUS (SHOVELNOSE STURGEON) #12

RECORDS PRINTED = 14